MEDICAL LIBRARY

MAY 2 1950

BRITISH MEDICAL JOURNAL

JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

SATURDAY APRIL 15 1950

TABLE OF CONTENTS

Development and Behaviour of Children NORMAN B. CAPON, M.D., F.R.C.P. 859

Vasodilators in Peripheral Vascular Disease
A. H. DOUTHWAITE, M.D., F.R.C.P., and T. R. L. FINNEGAN, M.B. 869

Factors Associated with Perforation in Peptic Ulcer
CHRISTOPHER STRANG, M.D., M.R.C.P., and I. O. B. SPENCER, M.B., M.R.C.P. 873

Dental Cavities in the Golden Hamster J. D. KING, Ph.D., F.D.S. R.C.S. 876

Hypercalcaemia During Vitamin D Treatment
H. ST.C. C. ADDIS, M.B., M.R.C.P., and R. D. CURRIE, M.B. 877

Poliomyelitis in Cornwall in 1949 E. R. HARGREAVES, M.D., D.P.H. 879

MEDICAL MEMORANDA

Necrosis after Penicillin. W. R. MAY, M.B., B.S. 883
Adrenocorticotrophic Hormone in Acute Disseminated Lupus Erythematosus. D. G. FERRIMAN, D.M., M.R.C.P., and R. B. N. WILSDON, M.B., M.R.C.P. 884

REFRESHER COURSE

Modern Views on Uraemia and Dehydration. D. A. K. BLACK, M.D., M.R.C.P. 893

GENERAL ARTICLES AND NEWS

The Rothwell Sterile-water System and its Urological Application. A. M. McMASTER, F.R.C.S.Ed. 896
APPLICATION OF SCIENTIFIC METHODS IN INDUSTRY 898
ROYAL COLLEGE OF PHYSICIANS 900
MEDICAL NOTES IN PARLIAMENT 911
UNIVERSITIES AND COLLEGES 913
THE SERVICES 913
MEDICAL NEWS 915
BIRTHS, MARRIAGES, AND DEATHS 916
QUESTIONS AND COMMENTS 917

REVIEWS

Congenital Heart Disease 885
Technique of Intestinal Intubation 885
Textbooks of Dermatology 885
Medicine for Nurses 886
A New Zealander Looks Back 886
Books Received 886

MEDICO-LEGAL

Dermatitis from Hair Dye 911

Epidemiology Section 914

LEADING ARTICLES

Environment and Heredity 887
An Institution and an Office 888
Acute Perforation of Peptic Ulcers 889
Poliomyelitis after Immunization 890

ANNOTATIONS

Drug Treatment of Peripheral Vascular Disease 891
Laboratory's Answer 892
Smallpox 892

OBITUARY

Thomas Wilson, M.D., Ch.M., F.R.C.S. 908
John Stirling, M.C., M.B., D.A. 909
R. H. Watt, M.D. 909
H. Beckett-Overy, M.D., F.R.C.S. 909
H. Arwel Thomas, M.B., D.P.H. 910
W. E. Harker, O.B.E., M.D. 910
E. B. B. Brown, M.B. 910
Thomas McKelvey, M.B. 910
H. Carlile Sturdy, M.D. 910
J. H. A. Fleming, L.R.C.P.Ed. 911

SUPPLEMENT

Proceedings of Council *125*
GENERAL PRACTITIONERS' REMUNERATION *129*
Alleged Vile Temper—Disciplinary Regulations—N.H.S. Superannuation—Maternity Services in Northern Ireland *130*
HEARD AT HEADQUARTERS *131*
QUESTIONS ANSWERED *131*
SCOTTISH COMMITTEE *131*
FACULTY OF OPHTHALMOLOGISTS *132*
CORRESPONDENCE *132*
ASSOCIATION NOTICES *134*

CORRESPONDENCE

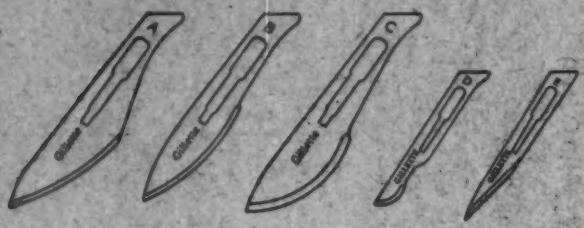
Menstrual Disorders. R. GREENE, D.M. 901
Ankle Amputation. W. GISSANE, F.R.C.S. 901
Gynaecology and Surgery. R. E. APPERLY, M.R.C.S.; H. V. CORBETT, M.D. 901
The G.P. at the Crossroads. R. C. MONNINGTON, M.D.; M. LASK, M.B.; H. V. DEAKIN, M.D. 902
The G.P. and the Maternity Service. H. G. HARVEY, M.R.C.S. 903
Psychiatry for Physicians. D. J. SALFIELD, M.D. 903
Aerosol Treatment with Penicillin. A. E. BERNSTEIN, M.R.C.S. 903
Leucotomy and Hypertension. J. R. CRUMBIE, F.R.C.S., and A. ZANKER, M.D. 904
Amateur Urology. D. SLOVICK, M.R.C.S. 904
Proguanil-resistant Falciparum Malaria. P. L. DESHMUKH, M.D. 905
Acute Inversion of the Uterus. C. J. DEWHURST, M.B. 905
Gastro-gastric Intussusception. S. C. RAW, F.R.C.S. 905
Anaesthesia for Fenestration Operation. A. C. FRASER, M.B., and M. SPENCER HARRISON, F.R.C.S.Ed. 905
Synchronous Double Primary Carcinoma. M. LETHBRIDGE FARMER, M.B. 905
Enlargement of Breasts. A. BAKHSH, M.B. 906
Health and Soil. F. K. HAYMAN, F.R.C.S. 906
Protection of the Worker. A. L. CRADDOCK, M.B. 906
Psoriasis and the Adaptation Syndrome. C. F. PATTERSON, M.R.C.S. 907
Definition of Senility. G. CROCKETT, M.B. 907
The Granny Racket. E. M. HICKEY, M.D. 907
Mongolism. M. ENGLER, M.D. 907
Medical Artists. SYLVIA TREADGOLD ..907
Malayan Institute for Medical Research. JOHN W. FIELD, M.D. 908

BRITISH MEDICAL ASSOCIATION, TAVISTOCK SQUARE, LONDON, W.C.1

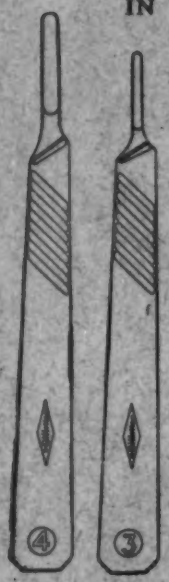
No. 4658, WEEKLY, PRICE 2/-

Copyright

REGISTERED AS A NEWSPAPER



IN THE SERVICE OF SURGERY



Gillette

Surgical Blades and Handles

The successful introduction of Gillette Surgical Blades has encouraged the development of a Gillette handle. Made from chromium-plated nickel silver, these handles are precision-machined to ensure perfect fit and complete rigidity in use with Gillette Surgical Blades.

Gillette Surgical Blades and Handles are made for each other and used together satisfy the most exacting requirements of surgical technique.

Gillette

Gillette Industries Ltd, Great West Road, Isleworth, Middlesex

ZŌPLA

STRAPPING

Zōpla Strapping is a first class product for surgical use. Very strong cloths, the mass is powerfully adhesive. White and Flesh Cloths, also on Elastic Cloth.

WHITE FELT

Zōpla on White Felt is very popular for padding and protective purposes. Does not harden in use.

ZŌPLA-BAND

Zōpla-Band, Elastic Adhesive Bandage, ideal where elasticity is essential.

MANUFACTURED BY

LESLIES LTD

EST. 1823

HIGHAM HILL RD
WALTHAMSTOW
LONDON, E.17

Emergency measure..

The anticipated effects of glucose as an energiser and restorer are to some extent lost if the patient shows a degree of unwillingness to accept it.

But the common aversion to the sickly, sometimes nauseating, taste of glucose in many of its ordinary forms is strikingly absent whenever LUCOZADE is offered.

LUCOZADE is so palatable, so refreshing, that neither children nor adults ever need urging to take it as prescribed.

(Containing Dextrose, Maltose and Dextrin in solution equivalent to 23% w/v Liquid Glucose B.P.)

LUCOZADE

An improved form of glucose therapy

LUCOZADE LTD., GT. WEST RD., BRENTFORD, MIDDX. M.16

SALTAIR

THE "SALTAIR" ARTIFICIAL BREAST

—the obvious solution of the psychological problem which frequently follows breast amputation. It restores the normal figure line, banishes self-consciousness, encourages resumption of normal activities. Can be worn while bathing, as it retains its shape when wet and can be easily dried. Available in the "Saltair" Brassiere or separately for sewing into patient's own foundation garment. Details to doctors on request.

Appointments at London address: 1, STANLEY HOUSE, 103, Marylebone High Street, London, W.1. Tel.: Welbeck 3034.

Guarantee

SALT & SON LTD BIRMINGHAM 2

BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 15 1950

DEVELOPMENT AND BEHAVIOUR OF CHILDREN*

BY

NORMAN B. CAPON, M.D., F.R.C.P.

Professor of Child Health, University of Liverpool; Senior Physician to Royal Liverpool Children's Hospital and Alder Hey Children's Hospital; Senior Paediatric Physician, Liverpool Maternity Hospital

I am deeply conscious of the honour conferred upon me, and upon the department of which I am Director, by the invitation to give this, the third, Charles West Lecture. And in expressing my appreciation and gratitude I should like to couple it with these words of Charles West, to be found in the preface to his lectures on the Diseases of Infancy and Childhood. "It is too late to hope for more than this: that when I have passed away, those to whom my memory will still be dear may hear my name sometimes mentioned as the founder of the first Children's Hospital that ever existed in this country." In this act of grateful remembrance, let us forget the touch of sadness—almost of bitterness—in his words, and let us rather rejoice that from the devotion and labours of those who have served the great institution which he founded has sprung much of the inspiration that has fostered the cause of paediatrics in this country during the past ninety years. No man can know how far his message will travel, and it is for succeeding generations to pay tribute where tribute is due—as I do now, to Charles West.

The outstanding characteristic of life during its embryonic, foetal, and childhood phases is the phenomenon of growth in mass (or weight) and in dimensions. It is accompanied by changes in the relative proportions of the component parts of the individual; by the development and elaboration of functions or skills consequent upon cellular specialization; and by a changing pattern of behaviour or reaction to internal and environmental conditions. The mode and degree of this evolution during childhood throw light upon the state of well-being of the individual, and its study is a source of great interest to all who deal with children, whether as parents, teachers, or paediatricians; but perhaps its special significance lies in the promise that it may carry for the future, when maturity succeeds to immaturity. Alexander Pope's famous line, "Just as the twig is bent, the tree's inclined," referred to the influence of education in childhood, but it is equally applicable to growth and development in a wider sense.

A vast store of information about growth, especially in regard to lower forms of life, is available, though the ultimate nature of the growth-urge and of the forces that restrain it still remains a mystery; and numerous studies of physical growth in childhood, and more recently of physiological and psychological development, have been made, especially in America (Gesell, 1945; Gesell and Ilg, 1946; Gesell and Amatruda, 1947; Tanner, 1949), and have provided us with a mass of detailed and specialized data. There is, indeed, some danger—as there is in most branches of medicine—that the accumulation of so much factual information about a specialized subject—such as growth and development in childhood—may confuse thought, and the time seems ripe for an assessment of the present position to be attempted.

In undertaking this task I approach my subject as a paediatric physician, and I shall at once stress the significance of two concepts which are as old as Medicine itself, though I think it is right to say that during the past fifty years or so they have received much fuller and more practical consideration than ever before. I refer, first, to health and its maintenance; and, secondly, to the study of the patient as an individual—that is, as a separate and complete unit of life.

Health in Childhood and Its Maintenance

Most children are born in a state of full health; but there are many that subsequently deteriorate through the successive grades of "average" health to subnormal health and, later, to disease. It is well that we should keep these terms in mind when we try to assess health status and to give practical expression to our aims.

There has been, especially during the past seventy-five years or so, a steady improvement in the status of child health. Accepted standards have been determined mainly by the influence of public opinion reacting to the leadership of a few pioneers, some lay, like the seventh Earl of Shaftesbury, and some medical. But it is a well-known fact that in the past both the public conscience and the medical profession as a whole have been relatively slow to respond to the tragedies of morbidity and mortality in childhood. The labours of such men as Mead, Pringle, Lind, and Jenner, whose studies were in the field of general preventive medicine rather than paediatrics, undoubtedly did much to focus attention upon the practical possibilities of prophylaxis, and they prepared the way for William Farr and Sir John Simon.

When one considers the harshness of the times in which these two men lived, their contributions to the cause of preventive paediatrics were outstanding. They recorded (during the period 1850–65) the damaging effects of subnormal health and actual disease in the community as a whole; they studied with the utmost industry the social, occupational, and economic conditions of the people; and they suggested, with much foresight and remarkable courage, some of the means of prevention. For them the

*The Charles West Lecture delivered at the Royal College of Physicians of London on November 22, 1949.

problem was not solely a matter of life or death: "For those places where infants are most apt to die are necessarily the places where survivors are most apt to be sickly; and where, if they struggle through a scrofulous childhood to realize an abortive puberty, they beget a still sicklier brood than themselves, even less capable of labour and even less susceptible of education. It cannot be too distinctly recognized that a high local mortality of children must almost necessarily denote a high local prevalence of those causes which determine a degeneration of race" (Simon, 1857).

The Report made in 1861 to the Privy Council by John Simon, who was then its medical officer, included specific reference to deaths in infancy; at that time the infant mortality rate in England and Wales was about 150 per 1,000. It is now under 40, and, although I shall not refer to the numerous influences that have played a part in causing this gratifying decline, I should emphasize that though the improvement is so satisfactory it does not justify complacency. Indeed, it imposes upon all those concerned with the welfare of children the duty of ensuring, so far as they can, that the standards which serve as ideals shall be still further raised.

Prophylaxis against death is a fine ideal, but prophylaxis against disease is still finer. And when we advance from this to prophylaxis against subnormal health—not amounting to disease, yet hindering potentialities for full development—we have ascended the heights from which the wide panorama of healthy childhood and manhood may be viewed. "Hitch your wagon to a star" is a suitable motto for those who aspire to make their contribution; but there must be care lest action ends with lip-service to an ideal.

The first step must surely be diagnosis—how are we to recognize subnormal health in childhood? I shall refer to this subject later, and for the moment it will be sufficient to emphasize that we must train ourselves to be sensitive to the positive attributes which characterize a healthy child. Some of these are physical—his colour, his posture, his delight in bodily exercise; some are intellectual—his zest to learn and his adventurous mind; some are emotional—his affection, his response to leadership, his loyalty. The differences between individual children are great and I am not suggesting that there is an accepted list of attributes and virtues which each child must satisfy before he can be called truly healthy. But it is only by making search for these and other evidences of health that the examiner can maintain his own diagnostic standards at a sufficiently high level; and in doing so he will find that he places increasing reliance upon the child's pattern of behaviour as a complete individual.

The Individuality of the Child

It is far from easy for a paediatric physician to make the sort of contact with his patient that an experienced general physician can establish with another adult; and without such contact, which implies an understanding of the patient's feelings and reactions, it is indeed difficult to assess a human situation satisfactorily. The passing of but fifteen years between the ages of 5 and 20—only one-fifth of an average life span, yet covering the whole mysterious transition from childhood to manhood—means a world of difference in human interests, emotions, and reasoning power, and it is hard, perhaps impossible, for most of us to recapture the outlook of our childhood days and to see life as our patients do.

Francis Thompson (1889) wrote of this difficulty as he, a layman, saw it: "We, of this self-conscious, incredulous generation, sentimentalize our children, analyse our children, think we are endowed with a special capacity to sympathize and identify ourselves with children, we play at being children. And the result is that we are not more child-like, but our children are less child-like. It is so tiring to stoop to the child, so much easier to lift the child up to you."

A doctor may understand that the dissimilarities between a child and a grown man are not to be measured merely by differences in weight and in relative size of parts; he may accept that the child, like the adult, has brain and spirit as well as body; he may have some knowledge of the patterns of physical and psychological reaction in childhood under normal and abnormal conditions. But these are only the first steps towards compounding his knowledge and experience into an understanding of each child as a separate unit of life—an individual in his own right, unique, capable of physical growth and development, and of mental, emotional, and social progress.

Whether the individual be sick or well, to understand his behaviour (using this word in the widest sense, to cover all his reactions to changes within himself and in his environment) as an individual or unit of life is one of our most important aims. "The proper study of mankind is man"; and this thought has stimulated enthusiasm for the recent developments that have been called psychosomatic medicine, social medicine, and industrial medicine. Latham (1836) emphasized the same point of view, in respect of sick humanity, when he wrote: "Diseases are not abstractions; they are modes of acting, different from the natural healthy modes—modes of disorganizing, modes of suffering, and modes of dying; and there must be a living, moving sentient body for all this."

To study the development of a child it is necessary to observe him through the successive phases of his life and to consider how he reacts to the conditions, normal and abnormal, that prevail; remembering always that the effects of trauma, infection, or other abnormal circumstances may be slow to show themselves. I propose, therefore, to make observations upon a child's progress from the beginning, at the fertilization of the ovum, through the successive embryonic, foetal, natal, and neonatal phases into the period of childhood proper; and to consider the more important factors or influences which act or may act in each stage. Genetic factors come first, chronologically, in the list; then the influence of intrauterine conditions, including the effects that the mother's health and environmental circumstances may have upon her embryo and foetus. Later comes the act of birth, which must be thought of not only as physical separation of mother and child but also as the culmination of remarkable changes in foetal anatomy and physiology. Finally, after birth, the child comes directly under the influence, sometimes beneficial, sometimes harmful, of his environment, which includes both physical and human components. And all through these successive phases growth and development are susceptible also to internal endogenous conditions, such as the influence of ductless glands.

The child's reactions may be local or general, temporary or permanent, and it is noteworthy that the responses of the individual in each phase of life are apt to colour his reactions in later phases. Indeed, for most people the possibility of attaining full health and normality in adult life depends more upon their health in childhood than upon any other factor.

Genetic Influences

Though the science of genetics has advanced considerably since Harvey wrote, "Neither the schools of physicians nor Aristotle's discerning brain have disclosed the manner how the Cock and its seed doth mint and coine the chicken out of the egg," the problems facing those that undertake investigations of human heredity are enormous. It is, of course, agreed that genetic factors are important in determining an individual's future health, but the details of their operation are imperfectly known and it is seldom that the doctor can speak to parents with any degree of certainty about the probable condition of their unborn child even when an accurate family history is available to him.

It now seems likely that many malformations or disordered states (for instance, mongoloid defect and kernicterus) are due to an interplay of genetic and acquired influences, and it may well be that the effects of hereditary mutation are not infrequently simulated by those due to environmental conditions. It will only be by continued investigation of the largest groups available—especially when familial examples are found—that we shall get a better understanding of genetic influences. A good example of the success which may attend this type of investigation is provided by the studies of pancreatic fibrosis conducted by Dorothy Andersen and Hodges (1946) and by others. In a recent review of this disorder, Lowe, May, and Reed (1949) confirm that the disease results from a single Mendelian recessive gene which in the pure or homozygous condition causes a defect of the pancreas. These authors also concluded, from their studies, that between 2 and 18% of the general population carry the responsible gene in the concealed heterozygous state.

The detection of genetic carriers of inherited disease has valuable clinical significance, and the subject has been very well reviewed by Neel (1947). A most valuable compilation of the literature on human genetics has been published by Gates (1946).

Influences Operating During the Embryonic Period

It is obvious that the detailed study of man's development during embryonic life presents almost insuperable difficulties; yet it is a phase of life that is perhaps unequalled in the influence it may have, for good or ill, upon subsequent health and happiness. The urge to grow, measured by the relatively crude test of increase in weight, is stupendous. During the first six weeks of antenatal life the fertilized ovum, weighing about 0.005 mg., becomes an embryo of approximately 0.975 g., which is a multiplication of 195,000 times; it is as if a hen's egg (2 oz.) grew to a mass of 10 tons in the same period and proceeded to become a leviathan of 33,000 tons by the end of the normal (human) antenatal period.

The forces which direct and restrain growth must be no less remarkable than the dynamic growth-urge itself; and notice must be taken not only of genetic or truly hereditary factors but also of the potential impress of many environmental states and threats. The subject has received much attention in recent years, and valuable reports are to be found in the first Charles West Lecture by Sir Leonard Parsons (1944); in his Blair Bell Memorial Lecture (Parsons, 1946); in numerous contributions by Warkany (1947); and in the Ministry of Health (1949) report on neonatal mortality and morbidity. A fascinating account of human embryology and the influences which may disturb it is presented by Corner (1944) in his Terry Lectures.

I shall attempt no more than a brief summary, emphasizing aspects of special interest to clinicians. Among these, perhaps the most arresting has been the steady accumulation of evidence that pathological changes in the embryo's environment may cause faults of growth and development exactly resembling those that in the past have been ascribed to pure genetic causes. In general it may be said that the harmful effects of trauma, intoxications, infections, and other potentially damaging processes vary not only with the nature of the offending agent and the structure and functions of the tissue mainly attacked but also with the maturity of that tissue; and experimental (animal) embryology has provided numerous examples of disturbed growth and development caused by such differing stimuli as trauma, irradiation, hormones, lack of vitamins, etc., when these operate during the organogenetic period. In man, chief interest has centred around the possible effects that faults in maternal diet, irradiation of the mother's pelvic organs, and various diseases of the mother may have upon the embryo.

Maternal Diet

In regard to diet, it would seem reasonable, on general principles, to believe that the embryo is unlikely to suffer by the range of variations in diet ordinarily taken by mothers in civilized countries, and the general conclusions reached at a discussion held by the Nutrition Society (1942) supported this view. Yet various surveys of nutrition in pregnancy (Ebbs *et al.*, 1942; Balfour, 1944; the People's League of Health, 1946; Hobson *et al.*, 1949) which have taken place during recent years have suggested that the stillbirth and prematurity rates can be reduced by improving the quality and quantity of the mothers' diets. In all probability the beneficial effects of a high-quality maternal diet operate upon the child in the later part of antenatal life rather than during the early weeks when organogenesis is occurring. But there is a possibility that specific dietetic deficiency may be harmful to embryonic growth and development in man; and in this connexion Warkany (1947) describes the deformities that can be produced experimentally in animals with diets deficient in copper, iodine, and vitamins A and B.

In regard to the possible effect upon the human embryo of irradiation applied to the mother's pelvis, there is not yet enough evidence to reach a definite conclusion. The contribution by Goldstein and Murphy (1929) called attention to the danger, and since then gynaecologists have been on their guard, and it seems probable that a final answer will not be forthcoming for many years.

Rubella in the Mother

Although the aetiology of congenital malformations has been studied for centuries, it was not until Gregg's paper in 1941 that important evidence was published incriminating maternal disease (rubella) during the early weeks of pregnancy. It is now accepted that rubella and possibly other maternal infections may disorder embryonic growth, but their mode of action and the frequency of their operation are not known. A masterly review by Swan (1949) has surveyed the evidence against rubella, based upon more than 558 recorded cases in which there appeared to be a relationship between maternal infection and the development of congenital malformation, especially cataract, deaf-mutism (Clayton-Jones, 1947), cardiac deformity, and microcephaly.

Swan finds that on the available evidence a woman who contracts rubella during the first four months of pregnancy

has a 3 to 1 chance of giving birth to a congenitally defective infant; and Fox, Krumbiegel, and Teresi (1948) evidently accept the contentions of other workers that rubella during pregnancy increases the risk of congenital malformation from the usual figure of 0.9% to about 15%. But all those who have studied this question know that the histories given by mothers of their illnesses during pregnancy are often unreliable, and a committee of the American Academy of Pediatrics (1949) has recently emphasized the need for caution in interpreting this evidence.

Bradford Hill and Galloway (1949), using data collected by the approved societies operating under the National Health Insurance Acts before July 5, 1948, followed up 10 cases of rubella during pregnancy and found that of the seven babies born to mothers whose illness occurred during the first four months of pregnancy one had a congenital cardiac abnormality, one died when 5 weeks old (certified cause of death "pneumonia"), and five appeared to be free of any abnormality. In another report, Fox and Bortin (1946) followed up the records of 152 married women who had rubella during the years 1942–4 inclusive. Eleven of these women were pregnant at the time of the infection, five being affected during the first two months of pregnancy, four in the second to fourth months, one in the seventh month, and one in the ninth month. Of the six babies (one set of twins) born to the five mothers affected during the first two months of pregnancy one was stillborn (hydrocephalus) and one was said to be a "blue baby" at birth, with otitis media and hydrocephalus, but was later reported to have become "normal." The others were normal, as were also the six babies born to mothers affected by rubella subsequent to the second month of pregnancy.

The number of cases covered by these reports is admittedly small, but in general it may be said that the conclusions support clinical experience that in any series of miscellaneous congenital malformations the mother's history seldom reveals any infectious illness during pregnancy (Beswick, Warner, and Warkany, 1949).

My own private case records since early 1942 (and I present these rather than hospital records because I have taken the clinical histories myself and have been careful to inquire about German measles and other infections during pregnancy) include 243 examples of undoubted congenital malformation, made up as follows:

Mongoloid defectives	83
Other deformities affecting nervous system	37
Alimentary deformities	16
Congenital cardiac deformities	67
Urogenital deformities	5
Miscellaneous deformities	35

The mother of one mentally retarded baby had had German measles in the second month of pregnancy; the mother of one baby with congenital cardiac disease had had German measles 5½ to 6 months before the child was conceived; but in all the other cases the maternal histories were negative. The difficulty of assessing the harmful influence that maternal infection may have upon the embryo is increased by the fact that the frequency of congenital malformations appears to vary considerably—for example, geographically and in different social groups; furthermore, the accuracy of clinical observation and the criteria adopted will influence the findings. It is generally believed that, taking the country as a whole, the congenital malformation rate is about 0.5 to 1% of all births occurring after the 28th week of intrauterine life; but the figure is considerably higher than this in the practice of some maternity hospitals. For instance, during the period 1927–42 the incidence of malformations in the Liverpool Maternity Hospital was 2.3% of all infants born alive—but it should be noted that this report includes even minor malformations such as small supernumerary digits.

It may be that some acute infections contracted by the mother during pregnancy destroy the embryo, which is then lost as an abortion; whereas the virus of rubella is seldom toxic enough to kill, and the child is likely to be born alive but possibly deformed. In this regard it is interesting to note, as evidence that maternal rubella may be fatal to the foetus, that Swan (1948) in a study of 760 stillbirths in South Australia (1939–45) found 16 instances (one doubtful) of maternal rubella during pregnancy, and in 13 of these cases the infection had occurred during the first four months.

From the preventive point of view, the possibility of granting immunity to potential mothers who have not had rubella during childhood has been considered, and Anderson (1949) has demonstrated that rubella may be transmitted by spraying suitably treated throat washings of affected subjects into the nostrils and oropharynx of volunteers. This artificially induced infection seems to confer immunity.

There is as yet no clear evidence incriminating the common infectious diseases, apart from rubella, as a cause of congenital malformations; Fox, Krumbiegel, and Teresi (1948) have made a recent report on this subject in regard to measles, mumps, and chicken-pox.

Influences Operating During the Foetal Period

Apart from untreated syphilis, it is unusual for disease of the mother to be transmitted through the placenta to her child, at all events in this country; and the placenta itself is seldom invaded either by infection, such as tuberculosis, or by growth, though Eardley Holland (1949) has reported an interesting example of malignant melanoma which was transmitted by the mother to her foetus.

Toxoplasmosis

Attention has been called in recent years to toxoplasmosis in foetal life (Sabin, 1941, 1942, 1949; Parsons, 1946; Adams *et al.*, 1948; Jacoby and Sagorin, 1948; Farquhar and Turner, 1949; Nutt *et al.*, 1949), but the frequency of this infection is still unknown. The effect of the protozoon is to cause a low-grade inflammation in the foetal tissues, especially in the nervous system, and its clinical manifestations in the early months after birth are numerous, the most frequent being meningo-encephalomyelitis, microphthalmus, bilateral chorioretinitis in the central area of the fundus, and hydrocephalus or microcephalus. The child is frequently retarded mentally and is liable to have convulsions; intracranial calcification may be seen radiographically.

The protozoon can seldom be demonstrated in the child during life, but every effort should be made to do so, and the most promising investigation would appear to be intracerebral inoculation of mice or guinea-pigs with either cerebrospinal fluid or the material obtained by liver puncture (Gard *et al.*, 1949). Rapid advances are being made in the study of complement-fixation and other diagnostic tests for the presence of this infection in mother and child, and particular attention is being given to the differentiation of active or recent maternal infection from former infections that have probably become inactive. Sabin (1949) asserts that, with the use of an improved antigen prepared from toxoplasma-infected chorio-allantoic membrane, it can be shown that toxoplasmic complement-

fixation antibodies can persist in the mother's blood for at least six years and that during this period she may give birth to uninfected babies. Macdonald (1949) has also reported upon two methods of demonstrating specific antibodies—a neutralization test on the chorio-allantoic membrane of the developing hen's egg, and a complement-fixation test using infected chorio-allantois to prepare antigen. Adams *et al.* (1949), in a survey of diagnostic tests for toxoplasmosis, conclude that the slide neutralization test of Sabin and Feldman (1949) is the most accurate, the most economical, and the quickest at present available.

It is, of course, probable that toxoplasmosis is not the only infection or disorder capable of causing the clinical picture that has been described above, and the newer methods of diagnosis will undoubtedly help in distinguishing those examples which are definitely not due to toxoplasmosis, though their cause remains obscure. It is noteworthy that intracranial calcification seldom occurs except in cases due to toxoplasmosis.

Pathological Processes Affecting Growth

Whether toxoplasma infection is frequent or not, these studies have revealed another possible cause of foetal disease and have suggested that others await discovery. They have also called attention to the damaging effect upon growth—for example, microphthalmus—that may be caused by pathological processes operating upon the foetus subsequent to the organogenetic period.

In this category may fall also those cases described by Terry (1943, 1945) as retrolental fibroplasia, and by Krause (1946) and Ingalls (1948) as congenital encephalo-ophthalmic dysplasia. I have seen two of these cases recently. The baby is usually born prematurely, and the changes in the eyes may be seen at birth or may develop during the succeeding two or three months. A retrolental mass is observed, and there may be anterior and posterior synechiae, secondary glaucoma and cataract, and recurrent retinal and vitreous haemorrhages. Microphthalmus and strabismus are common; and the child may be mentally retarded, and may have microcephalus or hydrocephalus. In some cases single or multiple haemangiomata are found. The cause is unknown, but there is certainly no evidence of a genetic factor, and the lesion probably begins in the sixth or seventh month of gestation. In the earliest examples there seems to be a formation of connective tissue around the residual meshwork of the hyaloid artery; and in later cases there may be difficulty in distinguishing the condition from retinoblastoma, from metastatic enophthalmitis, and sometimes from tuberculosis and syphilis.

So much attention has been given in recent years to the fascinating subject of maternal iso-immunization by antigens present in the blood of the foetus (inherited from the father), though lacking in the mother's blood, that I do not propose to do more than mention it, as I must, of course, in discussing possible threats to foetal life. Recent general surveys are available (Medical Research Council, 1948; Cappell, 1948; Allott and Holman, 1949), and it is agreed that in most cases of haemolytic disease the antigen responsible is associated with the Rh factor, though, rarely, the blood group factors A and B may be the cause (Boorman *et al.*, 1949). Much remains to be discovered about the circumstances that transform a potentially dangerous situation into one of actual abnormality, for many babies that are at risk escape damage. It is apparent that some red cell antigens are more prone than others to produce immunization; and some women are more readily immunized than others. Furthermore, a specific type of placental lesion may be necessary before the child is endangered; and little is yet known of the foetal defence mechanism against a maternal threat of this sort.

Mystery still surrounds those cases of foetal deformity in which the so-called amniotic bands (Simonart's ligaments) are found. A fibrous cord may completely encircle a finger, the wrist, or any part of a limb; or sometimes one end of the band is attached to the child's skin and the other end is free or is attached to the inner surface of the foetal membranes. It is not known whether these cords are the result of inflammation causing adhesion of the amnion to the child's skin, and whether they may amputate a limb or part of a limb by interfering with the blood supply.

It is rather surprising that disorders of foetal growth ascribable to abnormalities of the mother's hormonal mechanism appear to be infrequent. One example may be mentioned—the relatively rapid growth of the foetus of a diabetic mother, probably as a result of her excessive pituitary secretion (Bigby and Avery Jones, 1945). The child may reach the average birth weight of a mature baby by the 36th week of pregnancy and thus there may be obstetrical difficulty at birth. It is interesting also to note that the birth weights of infants born to mothers who subsequently develop diabetes mellitus are greater than the average normal, and the total foetal mortality rate in such pregnancies is greater than in non-diabetic pregnancies (Barns and Morgans, 1948).

Deformity of the child may be caused by faulty position *in utero*, and I have seen numerous examples of this type of physical distortion during the twenty-six years that I have had charge of the babies in Liverpool Maternity Hospital. Asymmetry of the head, deformity due to pressure of the head downwards upon the thorax, torticollis, and pressure atrophy of the skin are examples. In most cases the abnormality gradually disappears after birth, but when treatment is necessary—for example, in cases of talipes—it should be given without delay (Browne, 1934).

Premature Birth

The many problems presented by premature birth are well known to paediatricians, and I propose to refer only to the ultimate prognosis of survivors. It must be remembered that about 5% of all live births occur prematurely, and that the number of immature children (5½ lb. (2.5 kg.) or under) born annually in England and Wales is probably about 43,000; their future is therefore a matter of considerable importance to the health of the nation as well as to the individual and his parents. At one time the accepted opinion was pessimistic, and it was thought that children who had been born prematurely were often of poor physical and mental status; in recent years there has been a tendency to take a more optimistic—perhaps too optimistic—view.

Prognosis varies with the cause of prematurity, the type of labour and quality of the obstetrical service, the facilities available for the medical and nursing care of the infant, and the economic and intelligence status of the parents. No observer has yet been able to follow up the after-histories of a sufficiently large number of premature babies to justify an authoritative statement upon prognosis, but the recent reports of two British authors will repay study. Asher (1946), in a survey of 217 immature babies, came to the conclusion that both mental and physical development are often delayed by premature birth, and she discusses the part that may be played by cerebral anoxia and intracranial trauma—to which the immature baby is particularly liable—in causing this general retardation. Her paper includes a valuable survey of the literature from 1919 to 1945.

Drillien (1947, 1948) concluded her comprehensive study of prematurity with a survey of the progress of 103 immature infants, and she compared them with 174 full-term children. She found that the premature infants were relatively retarded in developmental progress (2 months in standing and walking; 4.2 months in talking), and showed a significantly higher incidence of nasopharyngeal and respiratory infection, especially during the first year. Behaviour disorders, especially in regard to feeding, were more frequent among premature infants; but the incidence of dental caries, rickets, and cervical adenitis was no greater than in the mature babies, and it is suggested that this may be explained by the more assiduous administration of vitamins to immature infants.

My own experience has convinced me that the immature baby's environmental conditions during the first twelve months after birth play a very great part in determining his future, and he is indeed fortunate if by the accident of birth he is born into a home where the parents are intelligent, well housed, and economically capable of providing the best possible conditions for him.

Influences Operating During Childhood

I must now refer to the more important influences acting upon the child's development and behaviour subsequent to early infancy; and although my aim is to focus attention, so far as I can, upon the study of the child as an individual, and upon his behaviour and reactions as a complete being—a separate unit of human life—it will be desirable, indeed essential, to introduce certain subdivisions, and I propose to consider physical aspects, intellectual aspects, and emotional and social aspects of child life separately, and in each case to make reference to the assessment of the child's status in that particular sphere, with comments upon some of the conditions that may operate adversely in regard to each.

It must be remembered, moreover, that each person, even in childhood, has certain qualities or attributes—physical, intellectual, and emotional—which can for convenience be grouped together as his individual or constitutional pattern and which we must try to recognize and accept as a background to his growth and development. These attributes are not always measurable, and sometimes they are difficult even to describe satisfactorily. For instance, there are children that are tall and lanky, others that are sturdy and squat; there are children of high intelligence and others that show an excess of stupidity; there are children that prefer to be solitary and others that are sociable. Some children are by nature difficult to manage, and their parents deserve pity rather than criticism. It is obvious that in some cases there may be an unrecognized cause, some disease or deformity, that is responsible for the feature observed, but in many it seems reasonable to assume that the characteristic is innate and to be explained only on a constitutional basis.

These varying physical, intellectual, and emotional types serve to remind us of the wide range of normality, and with experience one learns that an attempt to bring about a change of these characteristics by what we call "treatment" may be unwise. The child's own adaptations, with advancing months and years, will often enable him to adjust himself when modifications are desirable for his own comfort and for the harmony of the society in which he lives. We should perhaps be more concerned with the potentialities of body, mind, and spirit than with his present state; and we must be careful that rash interference on our part does nothing to hinder a natural process of evolution.

1. Physical Health

In attempting to assess the physical status of an individual we may expect considerable variation according to sex, race, family predisposition, environmental conditions, habits of life, etc. The criteria usually adopted are based upon: (1) certain biometrical tests in which physical characteristics such as weight, height, haemoglobin percentage, and visual acuity are measured and compared with standards based upon the examination of large groups of supposedly healthy subjects and (2) observation of the neuromuscular (or, as some would say, psychomotor) attainments of the child at successive ages, assuming that there is no detectable mental or physical disease to handicap progress and performance.

In individual cases, and sometimes in relatively small groups of children, other tests have been applied, usually for testing some specific aspect of physical condition, such as ascorbic acid blood levels.

Biometrical Tests

In regard to biometrical tests, the measurement of weight and height is, of course, simple to record, and the literature contains many reports based upon large-scale investigations which provide standards for comparative purposes. Widdowson (1947) quotes some of these records, in particular the Board of Education figures in 1938 (Menzies, 1940) and the American reports of Baldwin and Wood (1923) and of O'Brien, Girshick, and Hunt (1941), whose paper is especially valuable because it is based upon the heights and weights of 147,000 children in various social and economic grades and living in seventeen different States. Widdowson's own data were obtained by examination of 916 British children of middle-class status, apparently healthy and for the most part living at home, and they were found to be closely in line with the American figures. A recent survey of 5,684 London children under the age of 5 years, made by Gore and Palmer (1949), provides valuable details in regard to infants and younger children. Data relating to boys attending thirteen boarding schools and six secondary day schools are given by Friend and Bransby (1947). But all these surveys, though valuable in furnishing evidence about average weight and height at various ages, and high and low normal readings, help little in the individual case; for, unless one can assess the child's constitutional type, weight and height alone may have little meaning; and, in any case, comparison should be made with an "optimum" rather than an average standard. Their significance for the individual child is, of course, greater if the readings are recorded at intervals of time, to give some indication of progressive changes with age and the varying conditions of life.

Wetzel's (1941) studies went a stage further in the attempt to record and measure physical status in childhood. In his "grid" system he claimed that by plotting height, weight, and age on a special chart or "grid" it was possible to separate the individual effects of various physical attributes such as physique (or body build), developmental level, and nutritional grade, and from these to reconstruct a graphic picture of physical progress; and he claimed that by the use of this method it was possible to recognize the onset of malnutrition before any signs could be detected by the ordinary methods of clinical medicine (Coleman, 1949). A point of particular importance was Wetzel's (1943) emphasis upon the use of a method which aimed at showing whether a particular child was keeping up to the best progress of which he was capable, rather than comparing him with some other child taken as a standard.

Many other formulae have been devised to throw light upon a child's physical status and progress: for instance, Tuxford's index, which concerns the relative lengths of the upper half and the lower half of the individual; the arm–chest–hip index (A.C.H. index) of the American Child Health Association; the nutritional status index—an elaboration of the former test; and many other somewhat similar schemes. They are to be welcomed because they stimulate further inquiry and encourage accurate quantitative measurements; and in time they will certainly help to clear up the confusing complication of the

child's constitutional pattern and the significance of differential rates of growth, as a result of which the individual's form changes from month to month. It is well known that different types of growth curve can be demonstrated for skeletal, nervous, lymphatic, and urogenital tissues, and this obviously has a bearing upon the complexity of growth of the body as a whole. The external characteristics of the individual at any one time are surely worthy of more detailed study, and it seems reasonable to believe that Sheldon's (1940) somatotype system or some analogous method of observing and recording the cardinal features of body-build (for instance, that proposed by Tanner, 1949) might be usefully applied to children, especially as more extensive anthropometric tables become available. Ellis (1948) has stressed that in assessing growth and "nutrition" of children between 9 and 18 years maturity is almost as important as chronological age. No composite growth curves can form a satisfactory standard of comparison for the individual case unless the curves are constructed from measurements made of children maturing at approximately the same age.

In regard to certain rather specialized tests, such as radiography (to determine bone-age), haemoglobin estimation, detailed examination of vision and hearing (of much importance when there is a suspicion that a child may be intellectually slow or inattentive or of faulty posture), these, and others, have considerable usefulness, but there are obvious objections to their general application; and it is therefore desirable that further efforts should be made to evolve "screening" tests which might help the clinician in selecting those children that require special investigations.

Neuromuscular Attainments

In regard to neuromuscular attainments, the work of Gesell and others who have made special studies of the attainment and progress of infants and children is well known: it has been one of the major contributions of this century to physiology and medicine. Above everything, it has illuminated the details of the integration which has long been known to exist between the nervous system and all other systems, and has emphasized a point of view that is fundamental to both preventive and curative paediatrics because it takes count not only of specific localized competencies and skills but also of the attainments and behaviour of the whole child as a separate unique individual.

If an adult develops defective vision or hearing he makes a series of adjustments, some voluntary, some unconscious, by which he adapts himself to the new conditions of his life, and with these adaptations and the memory-stored experience of his environment he is often able to avoid any considerable alteration of his life and habits. But an infant is not simply a miniature man; to him even a slight impairment of visual or auditory perception cuts down the range of his environment—what Gesell has called his "space-world"—and limits his opportunities for gaining experience from his surroundings. It is not surprising, therefore, that a physical handicap of this sort may be responsible in childhood for an irregular development of neuromuscular attainments and adaptations, and that these in turn may lead to unusual reactions as revealed in his posture, manual skills, intelligence, and general behaviour.

Factors in Physical Growth and Development

I have said enough about the assessment of a child's physical status to indicate that, no matter how valuable the results of special examinations may be—and indeed in some cases they are essential—their application cannot be made general; and probably the clinical opinion of the doctor with wide experience of both healthy and sick children gives us the best answer obtainable at present. I have indicated elsewhere (Capon, 1945) the practical details of the examination; and the necessity for ensuring that those doctors responsible for this important work are adequately trained and competent is strong support for some interchange of duties being arranged between those paediatricians that are concerned mainly with prophylaxis and those that work in hospitals.

I can do no more here than outline the factors which, in addition to the inborn capacity to grow and the other influences already discussed, may play a part in stimulating or retarding physical growth and development during childhood proper. Some are intimately related to diet, but in a community that is not suffering actual deprivation of food it is doubtful whether luxury dieting would confer physical blessings upon children. In this connexion it is interesting to note Widdowson's (1947) observation that similar individuals may differ enormously and unpredictably in their food habits, and that marked departures from the average daily intake of food are compatible with normal physical development.

On the other hand, specific dietetic deficiencies, such as the avitaminoses, may be very harmful to normal growth and development, as in rickets and scurvy. Adverse hygienic conditions, such as lack of sunlight and fresh air, uncleanliness, bad housing conditions, lack of adequate rest and exercise, may affect growth and certainly interfere with the development of a proper sense of values in regard to habits of life and standards of living. The diseases which disturb growth and development are very numerous. Gardiner-Hill (1937) called attention to the influence and interaction of four groups of possible factors—nutritional, infective, endocrine, and hereditary—and since that time there have been many advances in our understanding of these problems, especially in regard to endocrine disturbances.

2. Mental Health

Those who have devoted themselves to the study of psychology and psychiatry in childhood are the first to admit that many of their problems are likely to remain unsolved for many years to come; and clinicians who, like myself, possess no special knowledge of these subjects but can take only a general view of this aspect of a child's life need not, therefore, feel downcast by an inferiority complex. It is, however, a great pleasure to pay tribute to the special assistance that psychologists give to paediatricians, and in making the following comments upon mental health and intelligence status I ask for the indulgence of those with fuller knowledge of the subject than I possess.

If the child's intelligence is to expand to its greatest capacity the potentiality to develop must be present even before birth, and it is probable, unfortunately, that in about three-quarters of all cases of mental retardation the fault is inherited. Furthermore, the risks of antenatal, natal, and post-natal disease must be remembered. In addition, the integrity of the child's sense organs is very important; and he must have opportunities of learning under conditions, both at home and in school, that are likely to maintain full physical health and to bring contentment and happiness. The stimulus of encouragement is also needed by many children, though not by all; there can be no doubt that the results of mental training are greatly enhanced when the child's interest and enthusiasm can be aroused.

That is the background, and it is usually possible to discover by ordinary clinical examination and by commonsense inquiry whether any gross intellectual handicap exists. In many cases the clinician can go further, and is able to indicate, with a fair degree of accuracy, the cause of subnormal or retarded intelligence: for instance, an inherited tendency, a defect of vision or hearing, a crippling disease such as spastic paralysis, a lack of incentive and interest, an emotional difficulty. But the recognition of minor degrees of mental retardation—"minor" only in the relative sense, for any handicap of this sort is likely to limit potentiality for full health and happiness—and the elucidation of

specific types of intellectual handicap require special investigation.

The introduction of the so-called intelligence tests was an attempt to record and measure a child's inherited intellectual endowment, and its expansion with age. There will be no need for me to give any details; the revised Stanford Binet scale, by which a child's mental age is compared with his chronological age and with accepted standards, seems to have received most general acceptance. But there are innumerable modifications and variations of these tests, mostly designed to throw light upon particular aspects of intellectual capacity—for example, logical thought and educative capacity, verbal facility, kinaesthetic facility, and general scholastic attainment. Perhaps it should be emphasized that the proper use of intelligence tests requires much care and considerable experience on the part of the examiner, whose work must be done in a sympathetic, understanding, and unhurried manner. The time factor necessarily restricts the general use of intelligence tests, and it is doubtful whether "group" tests will prove to be satisfactory.

The incidence of subnormal intelligence is not known, and in fact could not be determined unless agreed standards were first defined. It seems probable, however, that between 4 and 7 per 1,000 children are mentally retarded to a degree that brings them to the notice of the school authorities or doctors; and as there are approximately 9,000,000 children under the age of 15 in England and Wales, the extent of this menace is obvious. But I submit that in the study of mental retardation our attention should be directed mainly to the recognition and treatment of children suffering from relatively slight degrees of subnormal intelligence. Such examples are numerous, and we know that some of them become delinquents, many suffer frustration, and all are apt to cause disharmony at home and difficulties in school. As a general rule investigation of these states of subnormal mental health provides more information, especially regarding aetiology, than studies of grossly defective children.

3. Emotional Health

I do not know that there are any accepted criteria for the assessment of emotional and social health, except the common-sense tests of a child's happiness, his harmony with those who come into contact with him, and his conduct or behaviour. It is always easier to recognize the abnormal than to define the normal, and this is no less true of emotional than it is of physical health. Our energies should be directed to studying the positive expressions of emotional and social health, for with this object in mind we shall better understand the causes of emotional instability and ill-health, and prophylaxis may then become a practical aim. I shall therefore make some observations upon the emotional needs of children and their relationship to the individual's progress towards mature development. My remarks will be based upon my clinical experience as a paediatrician and, during a period of 21 years' service in a "teaching" hospital, as a general physician.

Though I do not pretend to understand many of the hypotheses propounded by psychologists to explain what clinical observation reveals, I am well aware of the important part that the emotional state of an individual, whether child or adult, plays in his life; and of the need for harmonious adjustment between the individual and his environment. Yet when one refers to the writings of general physicians and paediatricians prior to the present century it comes as a shock to observe that this aspect of health and disease received little formal notice, though we are not entitled to assume that these observers were blind and deaf to the unusual manifestations of behaviour that may be exhibited by children, even when there is no obvious or demonstrable physical cause.

Charles West devoted to this subject 20 of the 878 pages in his *Diseases of Infancy and Childhood* (1884). Eustace Smith, in his 800-page *Disease in Children* (1884), states, "In the young subject signs of nervous disturbance may arise quite independently of actual disease in the nervous centres," but no more. Trousseau's (1868) lectures on *Clinical Medicine* (5 vols.) include one lecture on nocturnal incontinence of urine. Henoch devoted 38 pages to the subject in his lectures on *Children's Diseases* (1881), which extended to 930 pages. Ashby and Wright (1899), in their textbook *The Diseases of Children*, allocated no more than 12 pages out of 850 to nervous conditions such as night terrors, hysteria, and head-banging. Even in 1935, when the fourth edition of Pfaundler and Schlossmann's *Diseases of Children* was published in America, with the co-operation of 21 American paediatricians, only 84 pages of a total of 2,860 were devoted to the functional nervous disorders.

It is now generally agreed that insufficient attention has been given to the emotional development of children. If they are to be healthy and happy they must certainly have healthy bodies and minds; but in addition their nervous systems must be reasonably stable and capable of suitable adjustment to environmental variations. Maladjustment, which often leads to unhappiness, frustration, and sometimes to delinquency, may be related not only to physical disorder and to intellectual retardation and abnormality but also to emotional disturbances. Indeed, the correlation of physical, intellectual, and emotional disorders is so intimate that it may be impossible to say which fault is primary. And in the past there has been a tendency to regard emotional upsets in childhood as trivial complications occurring in the course of physical disease, or as demonstrations of wilfulness—sometimes actual naughtiness—which can be dealt with quite adequately by parents and teachers without resort to doctors.

It is, of course, true that sensible management of children in the home and school is important in preventing emotional disturbances; but there are three arguments which persuade me that these disorders of behaviour, and their early diagnosis and treatment, are well worthy of the attention of doctors. First, they cause ill-health and unhappiness to a considerable number of children and anxiety to their parents. Secondly, by recognizing the causes of these disorders and by ordering appropriate treatment the family doctor can make a splendid contribution towards achieving the ideal of full health. Thirdly, despite the scarcity of reliable corroborative evidence, a strong presumptive case can be made for the view that the seeds of nervous instability in adult life are often sown during childhood. My own experience is now long enough to have shown me—and there must be many present with longer experience who would doubtless agree—that a prolonged period of emotional imbalance in childhood may become ingrained in a person's constitution, and the instability may then be transmitted, in one form or another, to the next generation.

Instincts of Nutrition and Self-preservation

It requires no special knowledge of psychology to appreciate that the primary instincts of nutrition and self-preservation are powerful motive forces in children. The desire for food, stimulated by hunger, and the search for protection against environmental stresses and dangers are

fundamentals in life ; and the infant, like all young animals, turns to his parents for these services, for he has not yet learnt to seek actively for food that is not ready to hand, nor has experience taught him the adult's range of adaptation to changing environmental conditions.

Watch a cat with her kittens, or a mother nursing her baby, and you are at once struck by the fact that in this situation the young creature's fear—always more readily evoked than in later life—is in abeyance, and it appears to feel secure. There is usually some obvious evidence of affection (parental feeling for child, and love of child for parent) between the two, though it varies much in display ; and it is probably true to say that in humans, at all events, the display is not necessarily a measure of the depth or strength of the emotion. For full emotional health and development in infancy, parental affection and protection are necessary, and the child's needs for security and for the demonstration of affection must be supplied. Is it not true that mature men and women usually live fuller, healthier, and happier lives if they enjoy a sense of relative security—for instance, in respect of livelihood—and when they have someone with whom they can share affection ? And if this is true of adults, is it not still more true of children ?

To labour the point may seem unnecessary ; but it must be remembered that there are many homes where children are denied the satisfaction of these needs ; and in other places where groups of children are to be found, for instance in institutions, there may be a lack of respect for these emotional demands. This was one of the matters which Spence (1947) had in mind when he delivered his Charles West Lecture on the Care of Children in Hospitals. The Curtis Committee in its Care of Children Committee Report (1946) underlined the same point in paragraph 427.

Herd Instinct and Power Instinct

There are two other instincts which every doctor can observe when he studies children—the herd instinct and the power instinct. Most children are sociable, and seek the companionship of others of their own age group. For friendship, for play, and for amusement these associations satisfy elemental needs. But they are educational as well as recreational ; they provide standards of conduct and give opportunities for the " give and take " of life which may later develop into virtues such as loyalty and unselfishness. To desire possessions and to assert one's individuality in relation to environment are human characteristics which may become dominating and objectionable if they are not subjected to the restraining and guiding influence of a society made up of individuals at approximately the same stage of maturity. And this process of personality-moulding by contact with one's fellows does more than provide a pattern of behaviour ; it forms character, and conduces to the development of a well-balanced adult constitution.

But it is not enough to ensure that children enjoy affection, security (both physical and emotional), and the society of their fellows ; the immature organism needs some measure of guidance from without, until the habit of conforming to a pattern of life dictated by custom and conscience is learnt. And the guidance, control, or discipline—call it what you will—must be sympathetic yet authoritative, elastic enough to permit of self-tuition by some degree of trial and error, and based upon example and leadership rather than upon dictatorial command. (Miller, 1935, 1937.)

Hero-worship, the zest for adventure, and vivid imagination are childhood characteristics that may run wild without some beneficent control ; yet if they are suppressed there may develop from the rich potentialities of childhood nothing better than a half-man, drab, timid, lacking the fire of imagination and what Rupert Brooke called the " quick stir of wonder "—a creature unsympathetic and ungenerous. " Know you what it is to be a child ? "—wrote Francis Thompson. " It is to believe in love, to believe in loveliness, to believe in belief ; it is to be so little that the elves can reach to whisper in your ear ; it is to turn pumpkins into coaches and mice into horses, lowness into loftiness and nothing into everything, for each child has its fairy godmother in its own soul ; it is to live in a nutshell and to count yourself the king of infinite space."

Few can rise to such flights of expression, but we can all appreciate—indeed *must* appreciate, if we are to keep high standards of health as our ideal—that the urges of childhood not infrequently have their wings clipped by lack of understanding and by deprivation of opportunity. But opportunity without guidance during immaturity may easily transform liberty into unbridled licence. And the best guidance for children, with their faculty for imitativeness and habit formation, is affection blended with the stimulus of good example (Capon, 1947).

Personal Clinical Experience

I have studied the factors which, so far as my own experience goes, are chiefly concerned when emotional and social health is disturbed in childhood, and my conclusions are based mainly upon a series of 450 children referred to me with complaints which, in my opinion, were more probably ascribable to the influence of their human environment than to physical causes or to intelligence status. It is a fact that relatively few of these patients were submitted to specialized tests of physical health—for example, radiography—or to intelligence testing. Their histories were recorded by me and in each case I carried out a full clinical examination. Probably some of these children had organic lesions which I did not discover—for instance, oesophageal stenosis or partial deafness ; and I do not doubt that some were of subnormal mental status, though to a degree not recognizable at ordinary clinical examination. But I have been careful to exclude any child whose condition left me in doubt about the presence of an " organic " cause, and I shall therefore not make any further reference to the part that physical ill-health, intellectual retardation, and defects of sense organs may play in causing emotional and behavioural difficulties.

It is notoriously difficult and perhaps impossible to classify such cases satisfactorily, but I have found it useful to subdivide the patients into the following groups, according to the dominant symptoms and signs.

Group 1.—Characterized mainly by abnormal neuromuscular activity. Examples are : habit spasms ; some disorders of speech, such as stuttering and stammering ; nervous vomiting ; nervous diarrhoea ; nervous dyspepsia ; enuresis ; breath-holding ; head-rolling and head-banging.

Group 2.—Certain disorders of mental function, such as forgetfulness and inability for mental concentration.

Group 3.—Certain psychoneurotic manifestations, such as anxiety neuroses ; phobias, including night terrors ; negativism to feeding, sleeping, defaecation, micturition, playing, and sociability ; timidity and shyness ; outbursts of temper ; nervous irritability and sensitivity ; day dreaming and fantasies.

Group 4.—Examples of antisocial behaviour, such as untruthfulness, pilfering, truancy, and cruelty to children and animals.

In my series, the percentage distribution was: Group 1, 35% ; Group 2, 7% ; Group 3, 52% ; and Group 4, 6%.

Bearing in mind the fact that more than one-half of the patients were "only" children, it is hardly surprising that excessive or unbalanced parental affection, often amounting to over-protection, was frequently disclosed in the histories in Groups 1 and 3. One of the most frequent sequences was as follows. An "only" child of conscientious parents developed a trivial feeding disorder often due to a breakdown of breast-feeding. Failure to gain weight adequately, and perhaps anorexia, with colic and fretfulness, caused the mother to worry unduly about the child's nutrition; then followed several months of subnormal health during which the parents, losing sleep because of the child's fretfulness and perhaps receiving complaints from adjacent flat dwellers, became increasingly "on edge" and lost confidence in themselves; then gradually, as a reaction to irresolute and vacillating management, the child developed negativism to feeding and other manifestations of a functional nervous disorder, the details of which have been described by many authors, and notably by Cameron (1933, 1946).

It is noteworthy that a careful history usually indicates that the perplexities of the parents—often based on over-protection and aggravated by the disturbing effects of certain types of popular lectures, newspaper articles, and semi-medical papers in popular journals—have existed for many months, and that the child's nervous system has become increasingly unstable during the whole of this period. From time to time the occurrence of actual illness accentuates a difficult situation; and the conflicting advice of grandparents and neighbours may cause additional trouble, especially when it results in disagreement between the parents. And it must be remembered that even when correct advice is given to the mother she may find difficulty in following it if she is herself of the highly strung conscientious type, and particularly when she has no other children requiring her attention.

No less harmful than excessive protection is the failure by the parents to exercise reasonable discipline. In practice this usually means that a child should not be expected to make decisions which are beyond his powers of reasoning; such decisions must be made by the parents, and the child must obey. Authoritative control of this sort needs gradual modification as the child grows older; and I need hardly say that the parents who are most successful in maintaining a beneficent type of discipline are usually well-disciplined in their own lives and their control of the child is mainly by leadership and example. To appreciate the extreme ill-effects of lack of discipline in the home it is instructive to study a group of juvenile delinquents; and in many of the so-called "problem" families "it is not so much the physical as the mental and moral environment that is pre-eminently at fault" (Stallybrass, 1946). Regrettably, it is only too true that in many homes there is a lamentable absence of leadership; and in some families the child's sense of security is undermined by discord between the parents, and he has to face the problem of divided loya'ties.

The general conclusions that may be drawn from a study of the aetiology of functional nervous disorder in childhood point to the immense part played by a normal home life in the evolution of full health. It is from his human contacts, especially in the home, that a child derives emotional satisfaction and, with suitable guidance, develops self-reliance, unselfishness, and a sense of moral and social values. With this foundation his responses and reactions to the broadening experience of life that comes during later childhood and puberty will be encouraged to take shape in a spiritual sense. But if he is denied these advantages he is in danger of growing up under the handicap of an unstable nervous system, a victim to indecision and frustration because his inherent potentialities have not been able to come to fulfilment.

Conclusion

To summarize, I have tried to give some account of the conditions which influence and mould life during the antenatal and childhood phases and which play an important part in determining whether that life is to be healthy, happy, and of positive value in human welfare, or whether it is to be unhealthy, cramped, and—if not always unhappy to the child—at least a source of anxiety and distress to parents, and a demand upon the resources of society. Though it has been necessary to sketch the broad outlines of the subject rather than to give detail, I hope that I have been able to convey the idea that in childhood, perhaps more than in any subsequent period of life, it is essential that the highest standards of health should be demanded, and that nothing less than the best is good enough. Two tests of health in children stand out pre-eminently and form the basic criteria of a child's health status: the first is his growth and development; the second is his behaviour as a separate, though immature, member of society. The various methods of clinical examination, which are designed to provide information about the physical and mental condition of the child, are essential techniques towards this end, but they must be regarded as the preliminaries to a comprehensive survey of the child's conduct or behaviour as an integral unit of his society.

There is, of course, nothing essentially new in this idea: the wise doctor has always considered his patient as a man or woman who is suffering from, say, a growth or a tuberculous infection, rather than the uninteresting container in which some morbid process happens to be placed. But the evolution of the practice of medicine requires that, from time to time, attention should be focused upon some particular feature, and sometimes it may be advantageous that a new term should be coined to designate the idea and to stimulate—often critically and most usefully—the interest of the medical profession. Thus we have become acquainted with "positive" health, the psychoneuroses, psychosomatic medicine, social medicine, industrial medicine, and, most recent of all (and with a note of apology by its introducer), psychosocial medicine. I find myself on the side of those who hold that Medicine had always embraced the content of these novelties, though admittedly she has not always given them the encouragement and opportunities for free development that she might have afforded. But though I remain loyal to general medicine, I support the development of these offshoots, which the great advances of knowledge have made essential. This is not the time to speak of the relationships which should be encouraged between the specialist branches and the main trunk of the tree from which they have grown; but I cannot help hoping that no one will try to coin a word which is intended to crystallize the whole of this fundamental conception of paediatrics. Rather would I wish that paediatrics, which is general medicine during the period of childhood, should automatically and invariably signify that the patient as a whole has been considered.

One final word: I submit that the future offers to the medical profession still greater opportunities of service than it has enjoyed in the past—in both the curative and the preventive field—and that doctors engaged in paediatrics are likely to be especially fortunate in this respect, for their influence bears upon life during its formative period. To them are granted signal opportunities of helping children to grow up to manhood in such a way as to conform with Lord Morley's dictum that the great business of life is to be, to do, to do without, and to depart.

REFERENCES

Adams, F. H., Adams, J. M., Kabler, P., and Cooney, Marian (1948). *Pediatrics*, **2**, 511.
—— Kabler, P., Cooney, Marian, and Adams, J. M. (1949). Ibid., **4**, 490.
Allott, E. N., and Holman, C. A. (1949). *Lancet*, **1**, 209.
American Academy of Pediatrics (1949). *Pediatrics*, **3**, 259.
Andersen, Dorothy H., and Hodges, R. G. (1946). *Amer. J. Dis. Child.*, **72**, 62.
Anderson, S. G. (1949). *J. Immunol.*, **62**, 29.
Asher, Cécile (1946). *British Medical Journal*, **1**, 793.
Baldwin, B. T., and Wood, T. D. (1923). *Weight-height-age Tables for Boys and Girls of School Age.* American Child Health Ass., New York.
Balfour, M. I. (1944). *Lancet*, **1**, 208.
Barns, H. H. F., and Morgans, M. E. (1948). *J. Obstet. Gynaec. Brit. Emp.*, **55**, 449.
Beswick, R. C., Warner, R., and Warkany, J. (1949). *Amer. J. Dis. Child.*, **78**, 334.
Bigby, Mary A. M., and Jones, F. Avery (1945). *British Medical Journal*, **1**, 360
Boorman, Kathleen E., Dodd, Barbara E., and Trinick, R. H. (1949). *Lancet*, **1**, 1088.
Browne, D. (1934). Ibid., **2**, 969.
Cameron, H. C. (1933). *The Nervous Child at School.* Oxford Univ. Press, London.
—— (1946). *The Nervous Child.* Oxford Univ. Press, London.
Capon, N. B. (1945). *Arch. Dis Childh.*, **20**, 52.
—— (1947). "The Foundations of Health in Childhood." Convocation Lecture, National Children's Home. London.
Cappell, D. F. (1948). *British Medical Journal*, **2**, 323.
Care of Children Committee Report (1946). H.M.S.O., London.
Clayton-Jones, E. (1947). *Lancet*, **1**, 56.
Coleman, A. B. (1949). *J. Pediat.*, **35**, 165.
Corner, G. W. (1944). *Ourselves Unborn.* Yale Univ. Press, New Haven, Conn.
Drillien, C. Mary (1947). *J. Obstet. Gynaec. Brit. Emp.*, **54**, 300, 443, 452.
—— (1948). *Arch. Dis. Childh.*, **23**, 69.
Ebbs, J. H., Brown, A., Tisdall, F. F., Moyle, W. J., and Bell, M. (1942). *Canad. med. Ass. J.*, **46**, 6.
Ellis, R. W. B. (1948). *Proc. R. Soc. Med.*, **41**, 343.
Farquhar, H. G., and Turner, W. M. L. (1949). *Arch. Dis. Childh.*, **24**, 137.
Fox, M. J., and Bortin, M. M. (1946). *J. Amer. med. Ass.*, **130**, 568.
—— Krumbiegel, E. R., and Teresi, J. L. (1948). *Lancet*, **1**, 746.
Friend, G. E., and Bransby, E. R. (1947). *Lancet*, **2**, 677.
Gard, S., Magnusson, J. H., Wahlgren, F., and Gille, G. (1949). *Pediatrics*, **4**, 432.
Gardiner-Hill, H. (1937). *British Medical Journal*, **1**, 1241.
Gates, R. R. (1946). *Human Genetics*, vols. 1 and 2. New York.
Gesell, A. (1945). *The Embryology of Behaviour.* New York.
—— and Amatruda, Catherine S. (1947). *Developmental Diagnosis.* London.
—— and Ilg, Frances L. (1946). *The Child from Five to Ten.* New York.
Goldstein, L., and Murphy, D. P. (1929). *Amer. J. Roentgenol.*, **20**, 322.
Gore, A. T., and Palmer, W. T. (1949). *Lancet*, **1**, 385.
Gregg, N. McA. (1941). *Trans. ophthal. Soc. Aust.*, **3**, 35.
Hill, A. Bradford, and Galloway, T. McL. (1949). *Lancet*, **1**, 299.
Hobson, W., Lewis, F. J. W., and Woodman, D. (1949). *J. Obstet. Gynaec. Brit. Emp.*, **56**, 217.
Holland, Eardley (1949). Ibid., **56**, 529.
Ingalls, T. H. (1948). *Pediatrics*, **1**, 315.
Jacoby, N. M., and Sagorin, L. (1948). *Lancet*, **2**, 926.
Krause, A. C. (1946). *Arch. Ophthal., Chicago*, **36**, 387.
Latham, P. M. (1836). *Lectures on Subjects Connected with Clinical Medicine*, p. 37. London.
Lowe, C. U., May, C. D., and Reed, S. C. (1949). *Amer. J. Dis. Child.*, **78**, 349.
Macdonald, A. (1949). *Lancet*, **1**, 950.
Medical Research Council (1948). Memorandum No. 19: *The Rh Blood Groups and Their Clinical Effects.* H.M.S.O., London.
Menzies, F. (1940). *Report by the School Medical Officer (L.C.C.) on the Average Heights and Weights of Elementary School Children in the County of London in 1938*, King, London.
Miller, R. (1935). *Lancet*, **2**, 1393.
—— (1937). Ibid., **2**, 1469.
Ministry of Health (1949). Report on Public Health and Medical Subjects No. 94. *Neonatal Mortality and Morbidity.* H.M.S.O., London.
Neel, J. V. (1947). *Medicine*, **26**, 115.
Nutrition Society (1942). *Proc. Nutrit. Soc.*, 1944, **1**, 226.
Nutt, A. B., Wright, T., Bowie, J. H., and Beattie, C. P. (1949). *British Medical Journal*, **2**, 905.
O'Brien, R., Girshick, M. A., and Hunt, E. P. (1941). *Misc. Publ. U.S. Dept. Agric.*, No. 366. Washington, D.C.
Parsons, L. G. (1944). *Lancet*, **1**, 267.
—— (1946). *J. Obstet. Gynaec. Brit. Emp.*, **53**, 1.
People's League of Health (1946). Ibid., **53**, 498.
Sabin, A. B. (1941). *J. Amer. med. Ass.*, **116**, 801.
—— (1942). *Advances in Pediatrics*, **1**, 1. New York.
—— (1949). *Pediatrics*, **4**, 443.
—— and Feldman, H. A. (1949). *J. Pediat.*, **35**, 296.
Sheldon, W. H. (1940). *Varieties of Human Physique.* New York.
Simon, J. (1857). *Public Health Reports* (Sanitary Institute of Great Britain), 1887, **1**, 460.
Spence, J. C. (1947). *British Medical Journal*, **1**, 125.
Stallybrass, C. O. (1946). *Med. Offr.*, **75**, 89.
Swan, C. (1948). *Lancet*, **1**, 744.
—— (1949). *J. Obstet. Gynaec. Brit. Emp.*, **56**, 341, 591.
Tanner, J. M. (1949). *Lancet*, **1**, 405, 663.
Terry, T. L. (1943). *Arch. Ophthal., Chicago*, **29**, 36.
—— (1945). Ibid., **33**, 203.
Thompson, Francis (1889). *Shelley.* 1919. London.
Warkany, J. (1947). *Advances in Pediatrics*, **2**, 1. New York.
Wetzel, N. C. (1941). *J. Amer. med. Ass.*, **116**, 1187.
—— (1943). *J. Pediat.*, **22**, 82, 208, 329.
Widdowson, E. M. (1947). *Spec. Rep. Ser. med. Res. Coun., Lond.*, No. 257. H.M.S.O., London.

VASODILATORS IN PERIPHERAL VASCULAR DISEASE

BY

A. H. DOUTHWAITE, M.D., F.R.C.P.
Physician, Guy's Hospital

AND

T. R. L. FINNEGAN, M.B., B.S.
House-physician, Guy's Hospital

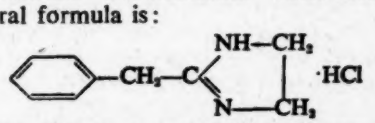
Brilliant achievements in the field of therapeutics have deprived the aged of peaceful death from pneumonia. We shall necessarily be faced with an increase in the number of sufferers from obstructive disorders of the peripheral arteries and arterioles. Their treatment is still disappointing, though sympathectomy marks a therapeutic advance. It is a major operation fraught with hazards for the elderly, and in any case is disappointing in the long run because of the frequency of relapse.

The common vasodilators—for example, nitrites, thiocyanates, and nicotinic acid—though producing intense flushing of the head and neck, seldom, in tolerable doses, influence the circulation in the hands or feet. Throbbing, headache, giddiness, palpitation, and transience of action render the volatile nitrites useless. Glyceryl trinitrate, though persistent, is more likely to cause headache than flushing of the extremities. The thiocyanates in therapeutic doses seem to have no influence on the peripheral limb vessels. Nicotinic acid was hailed as a drug likely to relieve Raynaud's disease and intermittent claudication (inflammatory or arteriosclerotic). It is true that it may cause an appreciable rise in the skin temperature of the feet and hands and its action is more prolonged than that of the nitrites, but the intense burning, pricking, and flushing of the face which must be caused if the extremities are to be influenced renders its use insupportable to the majority.

In the local treatment of vasospastic conditions carbachol or "amechol" (acetyl-β-methylcholine) ionization is of proved value.

Benzyl-imidazoline

The quest for more satisfactory vasodilators led to the discovery of benzyl-imidazoline. The hydrochloride of 2-benzyl-4:5-imidazoline, known by the trade name of "priscol," consists of colourless water-soluble crystals. The structural formula is:



Reports on its efficacy as a vasodilator began to appear in 1939, but interest in the drug lapsed during the war years. Braun (1942) claimed that it dilated arteries, arterioles, and arteriovenous anastomoses but had no effect on

capillaries. It differed, therefore, from histamine, and was stated to have in general a sympathicolytic action which would not be exerted in the absence of an intact sympathetic system. Experimentally it has been shown to block the pressor action of adrenaline. Furthermore, subsequent to priscol administration adrenaline exerts a vasodilator effect, thus resembling its action after ergotoxine. It was at first denied that it had a cholinergic action, but accumulated evidence suggests that this does exist, though the vascular effects mentioned above are not antagonized by atropine.

On the other hand, it increases the gastric HCl and stimulates the gut to contract; both actions can be prevented or overcome by atropine. It is probable that it does have some direct action on the vessel walls which is independent of the sympathetic supply.

Effects on Normal Subjects.—Winsor and Ottoman (1949) studied the influence of benzyl-imidazoline on the peripheral circulation of 70 males with no cardiovascular disease. In these experiments 50 mg. of the drug was injected intravenously. Changes in the volume and temperature of the digits were recorded. The temperature variations in muscle were also noted by means of a special needle inserted into the muscle and connected with the thermo-electric couple. The usual precautions in respect of preliminary rest and constant room temperatures were taken. In normal subjects 30 minutes after injection the temperatures increased over the resting readings as follows: forehead, 1° C.; index finger, 1° C.; calf muscle, 0.5° C.; subcutaneous tissue of calf, 0.25° C.; skin of calf, 0.5° C.; skin of toe, 3.75° C. There was no measurable alteration of rectal temperature. An increase of volume in fingers and toes was found, it being greater in the toes. The first effect on skin temperature of the digits was noted in about eight minutes after injection and the beginning of subsidence in 50 minutes. The two most noteworthy points emphasized by their experiments were that the lower limbs were affected more than the upper extremities, and that the action of the drug was exerted for much longer than that of the older vasodilators. The first fact is no doubt to be explained by the greater sympathetic control of the leg vessels.

Pallor, sweating, weakness, palpitation, and giddiness occasionally arose in these experiments and in similar ones by others. This effect is known as "priscol shock." It is advisable to test the sensitivity of the subject by administering 25 mg. by mouth. If such a dose has no unpleasant effect, 50 mg. intravenously may be given. If the oral dose causes appreciable flushing of the face, giddiness, or faintness, it is inadvisable to inject the drug into the blood stream.

Effects in Vascular Disorders.—The influence of priscol on obstructive vascular diseases has been widely studied. An excellent summary, with references, is provided by Grimson *et al.* (1948). It seems to be generally agreed that the best therapeutic results are to be seen in diseases in which vascular spasm plays the most important part. Raynaud's disease, erythema pernio, frostbite, and venous spasm resulting from faulty injection of irritants—for example, neoarsphenamine—are stated to respond dramatically well.

The results in intermittent claudication due to arteriosclerosis are, according to Grimson, less encouraging, and those in Buerger's disease frankly disappointing. He reiterates that priscol has no effect after sympathectomy.

Investigation of Priscol Action

For the purpose of this investigation 10 patients with no vascular disease, 4 with rheumatoid arthritis, 9 with Raynaud's disease, 24 with intermittent claudication of arteriosclerotic origin, 2 with claudication of thromboangiitis obliterans, and 6 with arterial hypertension without claudication were observed. A miscellaneous group of 6 is also mentioned.

Method.—In every case a test dose of 25 mg. was given orally. In only two was there evidence of priscol shock. They have been excluded from this series. The patients on whom temperature observations were made spent 24 hours in bed before the investigations. The room or ward temperatures were kept as constant as possible, and no experiment was carried out if a variation of more than 1° C. was recorded for 30 minutes before the test. Both index fingers and big toes were connected with the thermo-electric coupling skin leads, and 50 mg. of the drug was injected intravenously when a constant skin temperature was recorded from the digits.

Effects in Patients with no Symptoms of Vascular Disorder

Within one to five minutes of the injection a deep flush appeared over the face and neck and there was suffusion of the conjunctivae. A sensation of fullness in the head was complained of, but there was no severe headache. Consciousness of the heart's action or palpitation was not mentioned spontaneously, but was admitted on questioning. The pulse rate never rose more than 10 beats to the minute, and it dropped to normal as soon as the facial symptoms subsided. The rise was probably due to apprehension. Although some flushing of the face might have persisted for 10 to 15 minutes, the sensation and appearance of intense flushing usually disappeared within three to four minutes. About this time a noticeable change in colour of the fingers and hands was observed. A pink flush was soon seen in the feet, usually 10 minutes after the injection but sometimes later. The flushing of the feet and hands and the associated rise of temperature lasted from 50 to 90 minutes.

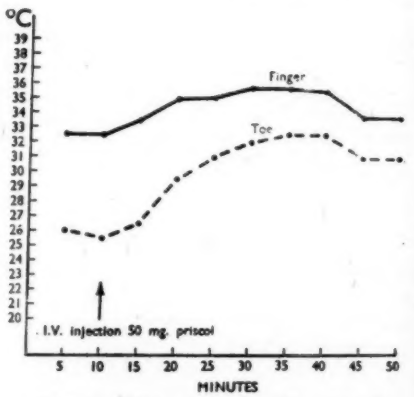


FIG. 1.—Man aged 32. No vascular disease. Record of finger and toe temperatures after intravenous injection of 50 mg. of priscol.

The readings before the injection showed that the finger-tip temperature was usually 5 to 6° C. higher than that of the toes. Coincident with the flushing there was a rise of skin temperature in the fingers from 2 to 3° C.; and in the toes from 6 to 7° C. (Fig. 1). During the height of the drug's action the two temperatures closely approached each

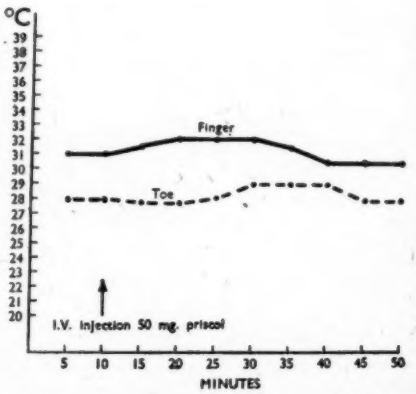


FIG. 2.—Man aged 67. Vessels normal for age. Note poor response owing to age. Compare with Fig. 1.

other, but the skin temperature of the toe never exceeded that of the finger.

It was found that individuals who were 60 years of age or more showed a slighter reaction both in the form of flushing and in the rise of temperature (Fig. 2). The latter might be only 0.5 to 1° C. in the finger and toe. Six such patients who were investigated were entirely free from symptoms of vascular disease: it must be assumed that senile rigidity of the vessel walls was already appreciable.

Effects in Patients with Vascular Disease

(a) Rheumatoid Arthritis

It is known that in active rheumatoid arthritis there is a grossly deficient circulation in the arterioles and capillaries of the fingers and of the toes if these are involved in the disease. Four such cases were given priscol, and in two of them temperature recordings were made. In three the general reaction was very much that already described in the normal, but in one whose temperature record is shown (Fig. 3) and whose fingers were chiefly involved it is seen that the finger temperature was much lower than that of the toe and that it rose rapidly some 5 or 6° C. after injection of priscol. During the priscol action there was some relief of stiffness in the affected joints in all four cases, but it was not enough to encourage further treatment, and in fact the subsequent administration of the drug by mouth produced no noticeable benefit.

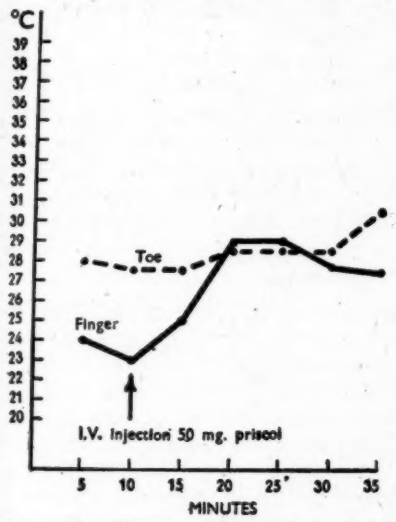


FIG. 3.—Woman with rheumatoid arthritis chiefly affecting the fingers.

(b) Raynaud's Disease

The nine female patients with Raynaud's disease had suffered from this for periods varying from 4 to 15 years. The three worst cases showed either small ulcers or scarring from previously healed ulcers on one or more finger-tips, extensive trophic changes of the skin and subcutaneous tissue of the fingers, and persistent patchy pallor with areas of cyanosis extending the whole length of the fingers and present even in the summer. The remaining six frequently had typical and severe attacks in the winter months and again when the hands became chilled, especially from immersion in cool water.

The immediate effect of priscol injection was dramatic, and was well shown in three cases of extreme severity. The usual changes, already described under "Effects on Normal Subjects," were seen, but in Raynaud's disease the feet flushed before the hands. We observed an early flushing of the proximal portion of the palms of the hands, and then some 10 to 15 minutes after the injection we could observe a steady advance of the edge of the pink area, spreading over the back and palm of the hands and up the fingers from the roots until finally even the tips were pink and warm. In the milder cases not actually presenting Raynaud's changes at the time, these were induced in one hand by immersion in cool water. Flushing from the drug then spread in the normal manner in the opposite hand and feet, and after a delay of about five to ten minutes the hand showing the Raynaud phenomenon gradually partook of the general vasodilatation. The most remarkable effect of priscol on patients with Raynaud's disease is that benefit seems to be much more lasting than it does in other vascular diseases (Fig. 4).

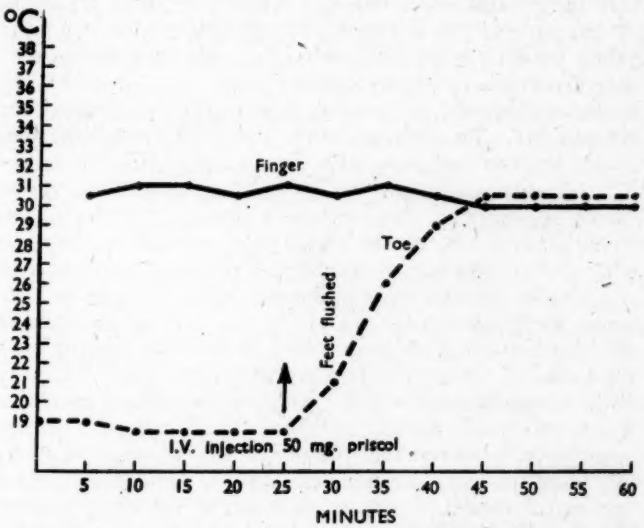


FIG. 4.—Unmarried woman with Raynaud's disease had had 25 mg. of priscol by mouth two days previously; this had caused her hands to flush, and they remained warm. The toes of one foot remained blue and cold until 30 minutes after injection of priscol, when they slowly flushed. Feet and hands remained warm and of normal colour for seven days, though no further treatment was given.

In one patient whose life had been made a misery by pain and coldness of the fingers without intermission for the previous six months a single injection of 50 mg. of the drug caused warmness of the fingers and loss of pain for seven days. In every case it was noted that in Raynaud's disease the effect never passed off completely in less than eight hours, and benefit lasted from one to two days after single injection in five other patients.

The treatment was then continued by giving 25 mg. of priscol by mouth four times a day with the aim of raising the dose to double this amount if it could be tolerated. The late results were not so encouraging as those which followed injection. The drug produced warmness of the extremities, but the patients seem to be peculiarly susceptible to the side-effects of priscol when it is taken regularly, although this is not shown on the single injection. Of the nine sufferers five declared themselves completely comfortable on a dose of 25 mg. four times a day; the other four have elected to take the drug from time to time, for it seems that if it is taken by mouth for a day or two it will give relief extending up to two weeks. During the days they are taking it they do, however, experience unpleasant palpitation, flushing, and giddiness which is more noticeable now that they are ambulant. If the dose is reduced to a level which will not cause these side-effects it also seems to fail to relieve the Raynaud symptoms.

With the exception of the results of ionization with carbachol or amechol the effects of priscol are far and away superior to those of any of the other vasodilators. It has been noticed, in local treatment with the carbachol group of drugs, that after 10 to 12 daily applications there is a tendency for the disease to remain quiescent for two or three months. It therefore seems that anything which will break the vasospasm is likely to give quite prolonged relief

in Raynaud's disease, whereas this does not occur in other forms of vascular obstruction.

(c) Intermittent Claudication

There were 24 male patients suffering from intermittent claudication due to arteriosclerosis. The youngest was 55, the oldest 70. Temperature recordings were made in six of these, and it was noticeable that the rise of temperature in feet and hands was at a much lower level than that of the normal. It corresponded, however, closely to the group of elderly persons without symptoms and signs of arteriosclerosis. These patients were later tested with priscol by mouth, again aiming at a dose of 50 mg. four times a day. This dosage was tolerated by them quite well except in five instances where only half could be taken. The effect of treatment was judged by the distance which could be walked without bringing on pain: this had been noted carefully before treatment was undertaken. Results were not recorded as good unless this distance was at least double the pre-treatment exercise. In 12 the results were good, the best being in a man of 56, whose walking capacity increased from 100 yards (91.5 metres) to half a mile (804 metres). In the older patients who improved, the range of increased activity without pain was usually an extension from 100 yards up to 500 yards (457 metres). It was noticeable, however, that the night pain of which so many of these patients complained was abolished in all the successful cases. There seemed to be no close relation between the age of the patient and the result, apart from the exceptionally good result already mentioned in the man of 56. In two there were trophic ulcers on the toes, which were blue and cold; the ulcers healed completely after three weeks' treatment.

From the observations of Ratcliffe (1949) it seems probable that large doses of vitamin E are likely to be more effective for this group. It might be well to combine it with benzyl-imidazoline in the first two months of treatment.

Only two patients with thromboangiitis obliterans were available for testing. In one, a man aged 41 (Fig. 5), the

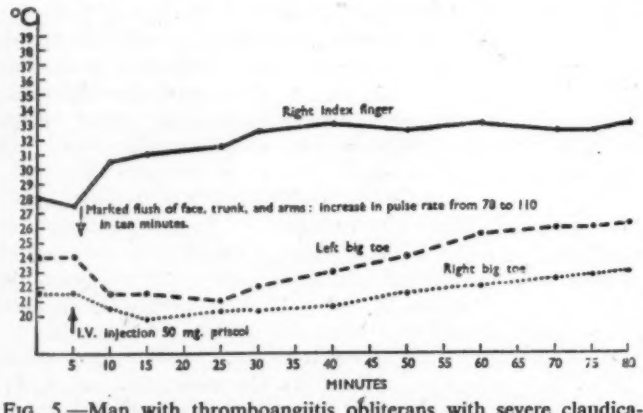

°C
Right index finger
Marked flush of face, trunk, and arms: increase in pulse rate from 78 to 110 in ten minutes.
Left big toe
Right big toe
I.V. injection 50 mg. priscol
MINUTES

FIG. 5.—Man with thromboangiitis obliterans with severe claudication. No arterial pulsation below femoral level.

temperature reaction to intravenous injection was extremely good, being pronounced in the legs. He, as might be expected, benefited considerably from taking the drug, although he was unable to manage more than 25 mg. five times a day. If any individual dose was larger than this he suffered from unpleasant side-effects. His walking capacity has been increased from 250 yards (228 metres) to a mile (1.6 km.). The other patient, aged 48, showed only a very slight flush after an intravenous injection of 50 mg., and oral administration was of no benefit.

(d) Hypertension

Six patients with hyperpiesia and no signs of arterial obstruction were tested for the effect of priscol, symptomatically and on the height of blood pressure. It has long been recognized that the blood pressure is not affected by the drug in doses below 100 mg. This dose was given to all six by mouth and caused intense flushing, palpitation, headache, and giddiness, and in two a sensation of dying. The pulse rate rose from 15 to 30 beats a minute. The systolic blood pressure fell 30 to 55 mm. Hg and the diastolic 10 to 15 mm. Hg. It was observed that smaller doses might produce almost equally unpleasant side-effects in hyperpietics without any fall of blood pressure.

(e) Miscellaneous

Five patients with chronic fibrositis and much general stiffness and one with sclerodactyly were treated with priscol intravenously and subsequently by mouth. In the rheumatic cases the flushing followed the usual pattern, but there was no appreciable loss of stiffness or pain. The woman with sclerodactyly showed a slow but satisfactory response in the fingers, which had already undergone trophic changes closely resembling those of Raynaud's disease. Improved movement followed, but she has not been under observation long enough to justify any further report.

Discussion

From the above observations it is clear that benzyl-imidazoline is a powerful vasodilator which seems to exert its main effect on the arteries and arterioles of the extremities; only in larger doses does it give rise to widespread dilatation and fall of blood pressure. It is singular in that, in contrast to other vasodilators, it has only transient effect on the blush area but has striking and prolonged influence on the vessels of the fingers and toes. Although the study of the pharmacology is not yet complete, it seems that the main effect of the drug is that of a sympathicolytic substance, but, in spite of earlier statements to the contrary, it is probable that there is also some direct effect on the vessel wall independent of the sympathetic supply. In one of the three very severe cases of Raynaud's disease mentioned above, the patient had been subjected to sympathectomy, both lumbar and cervical, with relapse of symptoms within one year. Her reaction to priscol was prompt and highly satisfactory.

From what we have observed of the effect on the temperature of the skin of the limbs in elderly persons as compared with the young, and in the purely vasospastic diseases as compared with the organic obstructive affections, it must be obvious that the best results are to be looked for where the element of spasm is maximal and organic blockage of the lumen is minimal. The complaint which stands out as suitable for priscol treatment is Raynaud's disease, but the proportion of cases of arteriosclerotic intermittent claudication which benefit from the drug is surprisingly high. It would seem rational to give the substance in cases of arterial spasm following trauma or embolism, and again in those disastrous instances of vasospasm arising from the introduction of thiopentone into an artery.

Summary and Conclusions

The effects of benzyl-imidazoline have been investigated in 10 normal subjects, 45 persons suffering from vascular disorder, one with sclerodactyly, and five with fibrositis.

Its pharmacology and literature have been briefly described.

Its value as a vasodilator in certain diseases has been discussed.

Benzyl-imidazoline has been found to have a more lasting vasodilator effect than other drugs commonly employed for this purpose. It has an elective affinity for the smaller arteries and arterioles of the fingers and hands and toes.

It is relatively non-toxic, but may produce certain unpleasant side-effects, which can usually be avoided by suitable gradation of dose.

It is outstandingly successful in the treatment of Raynaud's disease and of appreciable value in that of intermittent claudication of arteriosclerotic origin.

It should not be used for the treatment of arterial hypertension.

The weight of evidence is that it is of little value in thromboangiitis obliterans, but even here it is worthy of trial.

We express our thanks to Messrs. Ciba Laboratories Limited for the generous supply of priscol for these tests.

REFERENCES

Braun, H. (1942). *Med. Klinik*, **38**, 324.
Grimson, K. S., *et al.* (1948). *Ann. Surg.*, **127**, 968.
Ratcliffe, A. H. (1949). *Lancet*, **2**, 1128.
Winsor, T., and Ottoman, R. (1949). *Proc. Soc. exp. Biol., N.Y.*, **70**, 647.

FACTORS ASSOCIATED WITH PERFORATION IN PEPTIC ULCER

BY

CHRISTOPHER STRANG, M.D., M.R.C.P.

AND

I. O. B. SPENCER, M.B., M.R.C.P.

Medical Registrars, Royal Victoria Infirmary, Newcastle-upon-Tyne

This article records the results of a study designed to determine the factors associated with the development of perforation of peptic ulcers, and in particular to see if it is possible to predict the imminence of this complication.

The material consists of all cases of perforated peptic ulcer admitted to the Royal Victoria Infirmary, Newcastle-upon-Tyne, during the one-year period February 1, 1948, to January 31, 1949. In this time 189 patients were admitted. All, except two who came to necropsy, were treated surgically, consequently the diagnosis was confirmed in every case. Each patient was seen by one of us within a few days of admission and a detailed history was taken by following a set questionary. Thus, in addition to the patients' own statements, each was asked the same leading questions, and the moment of perforation was such a dramatic event that, almost without exception, they retained a vivid memory of what they were doing at the time and immediately before it. A full history was not obtained, however, in three critically ill patients.

Sex Incidence.—Of the 189 cases, 177 were males and 12 were females. Thus the male-to-female ratio is 14.8:1, which is much greater than the same ratio for peptic ulcer as a whole, which Tidy (1945) has given as 3.6:1. We have collected figures from the literature showing that of 1,349 cases of perforated peptic ulcer only 51 occurred in women, giving a ratio of 26.4:1. Therefore it would appear that not only is peptic ulcer less common in women but that, when present, the liability to perforation is considerably less than in men. Table I shows the age distribution in decades, the mean age, and the standard deviation for both sexes. It indicates that perforation is rare under the age of 20, but has a fairly even distribution in other decades.

TABLE I.—*Age Incidence*

Age in Years	No. of Male Cases	No. of Female Cases
Under 20	0	0
20–29	36	0
30–39	40	2
40–49	40	5
50–59	38	3
60–69	15	2
70–79	7	0
80 and over	1	0
Total	177	12
Mean age	44·5 ±1·1	49·3 ±2·9
Standard deviation	14·3	10·0

Occupation.—Thirty-five patients (18.5%) had jobs entailing a degree of responsibility which in our opinion was at least equivalent to that usually held by a foreman. This figure may be significant, for only 5% of the population served by this hospital have employment with a similar amount of responsibility.

Personal Factors.—An inquiry was made into some of the personal habits of the patients during the month which preceded perforation. The results of this are listed as follows:

Unusual cause of worry (e.g., employment, housing, or domestic difficulties)	33 cases	
Unusually long hours of work	47 „	
Irregular and hurried meals	58 „	
Moderate smokers	116 „	171 smokers
Heavy smokers (over 20 cigarettes a day)	55 „	
Heavy drinkers (over 4 pints (2·3 litres) of beer each night or 15 pints (8·5 litres) at the week-end)	20 „	

History

Previous Perforation.—A history of previous perforation was obtained in 22 cases (20 men, 2 women), and three of these had perforated twice before their present admission. Therefore 11.6%, or 1 in 8.6 cases in this series, had had a recurrent perforation. Pearse (1932) analysed the reports of 4,813 cases of perforated ulcer and found only 33 instances of recurrent perforation—an incidence of 0.69%, or 1 in 145 cases. The information in our series was deliberately sought by direct questioning, and it may be that recurrent perforation is more common than hitherto supposed.

Previous Haemorrhage.—A history of previous gastro-intestinal haemorrhage was obtained in 13 cases (6.9%).

Length of History.—Table II shows the duration of preceding gastric symptoms. It was once thought that most ulcers which perforated were acute or of recent origin. It will be seen from Table II that 129 cases (68%) had suffered from gastric symptoms for a year or more. This suggests that a long history has a definite bearing on the likelihood of an ulcer to perforate, and these figures support the view put forward by Gilmour and Saint (1932) that the older an ulcer becomes the more chance it has of perforating.

TABLE II.—*Duration of Symptoms*

	No. of Cases		No. of Cases
No previous symptoms	13	20 to 30 years	15
Less than 1 week	4	30 to 40 „	6
1 week to 1 month	18	Over 40 „	1
1 month to 1 year	22	No information	3
1 to 5 years	46		
5 to 20 „	61	Total	189

Type of History.—Those patients who gave a history of previous indigestion were divided into two groups (Table III), one comprising those with a typical ulcer history

TABLE III.—*Type of History*

Typical ulcer history	121 cases	64·0%
Vague dyspepsia	52 „	27·5%
No previous indigestion	13 „	7·0%
No information	3 „	1·5%
Total	189 „	100%

(as judged by the usual criteria) and the other those with a history of vague dyspepsia. It has been emphasized by many authors that the majority of patients with a perforated ulcer give a history of previous indigestion. The proportion of these cases in our series, however, is higher than that of other observers—a fact which can probably be explained by our method of taking histories a few days after operation. The patient by this time is more likely to recall some old complaint than he would be just after admission.

Symptoms Preceding Perforation

In 135 cases (71.4%) an exacerbation of symptoms occurred immediately preceding the perforation. The duration of these symptoms is shown in Table IV. In most of these cases it was a fortnight or less. In 66 patients (49% of the 135 cases) the symptoms were definitely worse than those usually experienced, and in 87 patients (64% of the 135 cases) the symptoms had a crescendo character.

TABLE IV.—*Duration of Exacerbation*

	No. of Cases		No. of Cases
Less than 1 week	58	5–6 weeks	1
1–2 weeks	30	Over 6 weeks	12
2–3 ,,	13	No information	2
3–4 ,,	15		
4–5 ,,	6	Total	137

In 52 cases (27.5% of the total number) perforation occurred without any previous warning symptoms. It has already been stated that 13 cases had no previous history of indigestion whatsoever, and that in them the perforation was the first indication of a peptic ulcer. The remaining 39 cases had suffered some form of indigestion in the past, but their perforation occurred at a time when they were apparently quite well. That as many as 27.5% of the cases should perforate in this way seems to us significant in view of the difficulty it might cause in diagnosis.

The type of pain, or other symptoms, occurring during the three days before perforation was inquired into more closely; the results are shown in Table V.

TABLE V.—*Type of Pain*

	No. of Cases
Pain constant	41
Pain intermittent	69
Pain absent	52
Other symptoms (e.g., nausea, heartburn, epigastric fullness, or heaviness)	25
No information	2
Total	189

Other complaints during this time were loss of appetite (75 cases) and vomiting (41 cases).

Many patients claimed to be following a diet even up to the time of perforation, but the standard of these diets varied so widely that we have not thought them worth consideration. Three cases, however, perforated while in hospital undergoing medical treatment for peptic ulcer.

Relation to Work and Posture

The activities of the patients at the moment of perforation are summarized in Table VI. A man's day may be roughly divided into three parts, of which one is spent in bed, one at work, and one according to his own interests. It will be noted from the figures above that the results closely follow this rough division, for 31.7% of the perforations occurred at work and 27% while in bed.

TABLE VI.—*Activity at Time of Perforation*

	No. of Cases		No. of Cases
At work	60	Walking or standing	63
Not at work	127	Sitting	52
No information	2	In bed (25 cases asleep)	51
		Straining	12
Total	189	Stooping	9
		No information	2
		Total	189

The question of straining at the moment of perforation was inquired into carefully, but only 12 patients admitted to this, and there was no instance of direct trauma to the abdomen. Corlette (1931) applied the laws of physics to this problem and showed that an increase in intra-abdominal pressure will not cause any strain on an ulcer.

Consideration of the figures quoted would not lead one to suppose that posture and physical activity were factors involved in the perforation of a peptic ulcer.

Relation to Preceding Meal

The time interval between the last meal and the acute pain of perforation is shown in Table VII.

TABLE VII.—*Time Since Last Meal*

	No. of Cases		No. of Cases
During or immediately after meal	16	5–6 hours	15
Within 1 hour	20	6–12 ,,	16
1–2 hours	23	12–24 ,,	3
2–3 ,,	30	Over 24 hours	4
3–4 ,,	39	No information	4
4–5 ,,	19	Total	189

When one allows for the fact that many cases perforated during the night and a long time after their evening meal, it will be seen that the fairly even distribution of cases in Table VII does not suggest that perforation is associated with any special phase of digestion.

Inquiries were also made about the type of food and the size of the last meal, but neither of these seemed to have any influence on the development of perforation.

Month, Day, and Hour of Perforation

Seasonal Incidence.—Attempts have been made by several authors to assign a seasonal incidence to the development of perforation. Griswold and Antoncic (1941) for example, showed that the greatest number of their cases occurred in the spring. Hinton (1931) found an increased frequency in the spring and autumn months, and Berson (1942) described a mild seasonal variation with a relative infrequency of cases in the summer. The best study of this question has been carried out by Jamieson (1947), who investigated all the cases treated at the three main Glasgow hospitals over a period of 22 years. He found that the incidence was uniform throughout the spring and summer but fell off strikingly in the autumn, to rise again to a peak in the winter.

The monthly incidence in our cases is shown in Table VIII. No significance can be attached to the monthly variation in such a small number of cases, but it may be noted that the number in the autumn months is considerably less than in any other season.

TABLE VIII.—*Monthly Incidence*

	No. of Cases			No. of Cases	
February	12	54	August	10	31
March	17		September	9	
April	25		October	12	
May	16	42	November	21	62
June	12		December	17	
July	14		January	24	
				189	

TABLE IX.—*Day of Perforation*

	No. of Cases		No. of Cases
Sunday	20	Thursday	22
Monday	34	Friday	31
Tuesday	24	Saturday	32
Wednesday	26	Total	189

Day of Perforation.—Table IX shows the day of the week on which the cases perforated. The figures reveal no significant daily variation, and so fail to support Jamieson's contention that perforation of a peptic ulcer is relatively uncommon on Sundays and Mondays.

Hour of Perforation.—A record was made of the time of day at which perforation occurred, and the results are given in Table X. This shows that perforation is nearly twice as common in the afternoon and evening as in the morning.

TABLE X.—*Time of Day of Perforation*

	No. of Cases	
Midnight to 6 a.m.	37	68
6 a.m. to 12 noon	31	
12 noon to 6 p.m.	55	121
6 p.m. to midnight	66	

Site of Ulcer

In a few cases the surgeon found difficulty in locating the ulcer accurately. The pyloric vein and other landmarks are not always clearly visible at operation, and it may be difficult to decide whether a pyloric ulcer is gastric or duodenal. The probable site was decided by the surgeon, and the numbers of each type of ulcer are shown in Table XI.

TABLE XI.—*Site of Ulcer*

Site		Males	Females	Total
Duodenum	Anterior wall	137	4	145 (76·7%)
	Posterior wall	4	0	
Stomach	Lesser curve	12	4	43 (22·8%)
	Pyloric antrum	23	4	
Jejunum		1	0	1 (0·5%)
Total		177	12	189 (100%)

These results show that in men perforation of a duodenal ulcer is four times as common as perforation of a gastric ulcer. In women perforation of gastric ulcers preponderates in the ratio of 2:1. The number of female cases, though small in comparison with the males, shows a reversal of the ratio of duodenal to gastric ulcers which is of statistical significance.

Discussion

Perforated peptic ulcer is a common condition in the North-east of England, and the admission to one hospital of 189 cases in a period of one year has afforded an unusually good opportunity of studying the circumstances associated with this event.

Various factors which have been thought to play a part in the aetiology of perforation were investigated, and some which were previously recognized have been confirmed. Thus we found a great preponderance of males and a high incidence of duodenal ulcers, although in women a significant difference was observed in that gastric ulcers were twice as common as duodenal ulcers.

It is interesting to note, too, the high percentage (18.5%) of patients who had employment entailing responsibility, and the very similar percentage (17.5%) who admitted to having some recent worry. However, these did not prove to be the same patients, and so, although responsibility, with the worry it entails, plays an accepted part in the aetiology of peptic ulcer, it does not seem to be implicated in the aetiology of perforation.

Investigation of the personal habits of the patients showed that 29% were heavy smokers and 10% were heavy drinkers, and the vast majority of the latter proved to be heavy smokers as well. We do not know the incidence of those who indulge heavily in tobacco and alcohol in this area, but we do not believe it to be as high as this. However, neither of these habits could be correlated with the onset of perforation, for in every case the patients had been indulging in them for years. This was also true in the case of the 31% of patients who admitted to taking hurried and irregular meals. Consequently, although these factors may be involved in the aetiology of peptic ulcer, or are, perhaps, common habits in the type of individual who develops a peptic ulcer, they do not appear to be of importance in our present study. Furthermore, the actual moment of perforation did not seem to be associated with physical activity or straining, the position of the patient, or any particular phase of digestion.

We had hoped that, as a result of our investigation, it might be possible to define a recognizable pattern of symptoms preceding perforation and so enable the medical practitioner to predict its onset, but our inquiry has not yielded information of this nature. During the three days before perforation 28% of the patients had no gastric symptoms whatsoever, 37% complained of intermittent abdominal pain, 22% of constant pain, and 13% of vague complaints such as nausea, heartburn, and a sense of fullness. If a doctor had visited these patients shortly before perforation occurred it is unlikely that he would have been able to anticipate the approaching disaster in the great majority of cases. Constant pain for several days, especially if becoming progressively worse, may be a warning of perforation; but this symptom is not specific, for it occurs during an exacerbation of ulcer symptoms without perforation.

Our study has led us to conclude that perforation is an unpredictable complication of peptic ulcer. In the majority of cases it will follow a recognizable period of indigestion or ulcer pain, associated perhaps with loss of appetite and vomiting, but in an appreciable number of cases there will be no warning symptoms whatsoever.

Summary

A total of 189 consecutive cases of perforated peptic ulcer admitted to one hospital during the period of a year have been studied. Our interest was focused on certain factors thought to have a bearing on the aetiology of the condition and on the symptoms immediately preceding perforation.

The great preponderance of males and the high incidence of duodenal ulcers were confirmed. In men, perforated duodenal ulcer was four times as common as perforated gastric ulcer. In women, however, perforated gastric ulcer was twice as common as perforated duodenal ulcer.

In 91% of patients a history of previous indigestion was obtained: in 64% this conformed to a typical ulcer pattern. In 68% the history of indigestion lasted for longer than one year.

The onset of perforation seemed to be unrelated to individual habits of eating, drinking, and smoking, or to a particular phase of digestion, and the moment of perforation was not correlated with the position of the patient, straining, or physical activity.

Perforation occurred less often in the autumn than in the other seasons. The daily incidence varied little, but perforation was more frequent from midday to midnight than in the morning hours.

In the three days preceding perforation 22% of the patients had constant abdominal pain, 37% intermittent pain, 28% no pain, and 13% vague symptoms such as heartburn and nausea. There was no specific pattern of symptoms which led up to

perforation, and the latter seemed to be an unpredictable complication of peptic ulcer.

We would like to express our thanks to Professor F. H. Bentley and the surgeons of the Royal Victoria Infirmary for their kindness in allowing us to see their cases, and to Mr. H. Campbell for his help with the statistics.

REFERENCES

Berson, H. L. (1942). *Amer. J. Surg.*, **56**, 385.
Corlette, C. E. (1931). *Med. J. Aust.*, **2**, 587.
Gilmour, J., and Saint, J. H. (1932). *Brit. J. Surg.*, **20**, 78.
Griswold, R. A., and Antoncic, R. F. (1941). *Ann. Surg.*, **113**, 791.
Hinton, J. W. (1931). *Surg. Gynec. Obstet.*, **52**, 778.
Jamieson, R. A. (1947). *British Medical Journal*, **2**, 289.
Pearse, H. E. (1932). *Ann. Surg.*, **96**, 192.
Tidy, H. (1945). *British Medical Journal*, **1**, 319.

DENTAL CAVITIES IN THE GOLDEN HAMSTER

BY

J. D. KING, Ph.D., F.D.S. R.C.S.

(From the Dental Research Unit, Medical Research Council, King's College Hospital Medical School, London)

The reported production of caries-like lesions in the molar teeth of the golden hamster (Arnold, 1942) has aroused new interest in the quest for experimental animals of value to workers in the dental field. Subsequent investigators assumed that the tooth cavities observed in animals receiving rations rich in carbohydrate, especially sucrose, were analogous to those found in human caries (Keyes, 1944; Dale, Lazansky, and Keyes, 1944; Orland, 1946; Sognnaes, 1948; Hurst, Firsbie, Nuckolls, and Marshall, 1948; Granados, Glavind, and Dam, 1948; Shafer, 1949; Mitchell and Shafer, 1949). On the other hand, I have shown that hamsters given wholemeal flour, wheatmeal bread, or white maize as their main dietary ingredient develop a form of parodontal disease associated with calculus deposition and food impaction leading to primary cavitation of the cementum and dentine of the tooth roots (King and Gimson, 1948–9; King, 1949).

Later disease phases include extension of the cavities into the pulp, followed by breakdown of the coronal dentine and enamel; but disintegration of the tooth crown, with the appearance of caries-like cavities, is essentially secondary to the initial root excavations which themselves result from the periodontal disturbances. The present note summarizes the first of a series of studies on the effects of replacing the cereal of such diets by refined or raw cane sugar, thus bringing the investigations more into line with those of the American workers.

Material, Methods, and Results

The experimental animals, all males, were obtained from two different sources, the approximate diets of the parents and of the offspring till weaning being as follows:

Medical Research Council Farm (M.R.C.).—Bread soaked in water, 16 parts; bran, 6; fishmeal, 3; whole wheat, 16; milk powder, full cream, 4; green foods, varied, *ad lib.*

Messrs. May and Baker (M. and B.).—Ground yellow maize, 55 parts; wholemeal flour, 15; ground linseed, 15; casein, 4; dried yeast, 5; milk powder, full cream, 5; salt mixture, 1. (The salt mixture comprised calcium carbonate, 5; sodium chloride, 5; iron citrate, 1; potassium iodide, 0.02.)

The hamsters were then given the following basal diet from weaning for an experimental period of six months: sugar, 65 parts; casein, 22 parts; dried live yeast, 0.5 part; alfalfa, 5 parts; sodium chloride, 1 part; peanut oil, 0.5 ml. daily. Each hamster received 10 g. daily of this diet moistened with about 10 ml. of water, and in addition 5 g of cabbage and 5 g. of carrot twice weekly. The animals from each stock were divided into two groups, one receiving the refined white cane sugar as used in this country and the other a specially prepared sample of raw sugar (pol. 96), the approximate percentage composition of these products being:

	Sucrose	Invert	Ash	Water	Organic Material
Refined	99·95	0·01	0·01	0·02	0·01
Raw ..	96·00	1·20	0·60	0·02	0·01

The fluorine contents of the two varieties of sugar, estimated according to the method described in the report to the Medical Research Council's Fluorosis Committee (1949, Memo. No. 22), were refined, 0.36 p.p.m.; raw, 0.3 p.p.m. F. Before mixing with the other dietary ingredients, the particle size of the sugars was rendered similar by grinding to powder form.

The results given in Table I are based on the presence of *definite* tooth cavitation visible in radiographs magnified three times; in each instance they were confirmed by dissecting microscope examination (× 18) of the tissues *in situ* with the aid of a fine exploratory broach.

TABLE I.—*Incidence of Dental Cavities in Hamsters: Radiographic and Dissecting Microscope Observations*

Stock Origin	Type of Sugar in Experimental Diet	Animals			Molar Teeth		
		Total Observed	Affected		Total Present	Affected	
			No.	%		No.	%
M.R.C.	Refined	20	8	40·0	240	14	5·8
	Raw	20	4	20·0	240	4	1·7
M. & B.	Refined	26	12	46·2	312	20	6·4
	Raw	22	10	45·5	264	15	5·7

It is evident that no firm conclusions can be drawn from these findings. In the M.R.C. stock groups those given the refined sugar seem to have been rather more prone to tooth destruction than those receiving the raw sugar, but in the M. and B. hamsters the effects of the two sugars were closely similar. It is of course possible that the stock (pre-natal and pre-weaning) diet may have influenced the issue, but even if this were so there is still no explanation of the apparent difference between the two main groups.

In other respects, however, the results were by no means sterile. On *x*-ray diagnosis, there was a general but not always consistent tendency for the upper teeth to be more affected than the lower: taking all groups together, the percentage incidence figures for the two jaws were 3.8 and 1.1 respectively. Histological examination of the material disclosed a much higher incidence of both maxillary and mandibular lesions but little difference in their proportionate distribution. By radiographic and by histological diagnosis the upper third and second and lower first and second molars, in that sequence, were the most prone to destruction. This observation is of interest in view of the similar distribution of calculus-induced parodontal disease in hamsters on high cereal rations (King, 1949), but assumes still greater significance when the histopathology of the present lesions is considered.

Decalcified serial sections were made from 48 teeth of the M.R.C. groups showing radiographically definite or suspected cavities. Histologically, 32 cavities were found, and in all but two the initial lesion was clearly sited in the cementum of the tooth root, whence it progressed into the dentine and often into the pulp; with involvement of the latter, secondary disintegration of the coronal dentine and

overlying enamel soon followed, simulating, but only in end-effect, coronal caries in man. In no instance could primary coronal cavitation be established. The animal cavities here, as in the cereal experiments, were invariably associated with progress of calculus-like material beyond the amelo-cemental junction, arousing inflammatory or other disturbances in the periodontal membrane and further facilitating the impaction of food debris. The most severe cavitation was generally found in those parts of the denture neighbouring on the openings of the salivary ducts, and excavation of an adjacent tooth root appeared to be largely dependent on extension of parodontal disease to that area. So far these findings have been confirmed in a further series of 146 sugar-fed hamsters by radiographic examination of all and by serial sections of 266 representative teeth. The precise mechanism of the cemental and dentinal breaches is now under active investigation.

Comment

It is of interest that root cavities may also result from calculus-induced parodontal disease in *ferrets* given diets containing relatively large amounts of bread or oatmeal (King, 1944; King and Glover, 1945), and in these animals, at least, identification of the calculus presents no difficulty. The amount of "calculus" obtainable by gently scraping teeth of affected hamsters is relatively small and determinations of its chemical composition have not yet been made. However, the presence of calcium in such scrapings has been shown histologically by Lillie's (1948) modification of the alizarin-red technique of Langeron (1933): the alizarin-positive hamster specimens compare well with similar preparations of human and ferret calculus. These observations—together with the manner in which the material builds up on the hamster's enamel cuticle, burrows into the gingival crest, pushes out the subgingival epithelium and forms a parodontal pocket, invades the periodontal membrane, and progresses along the cementum of the tooth root—strongly suggest the accretions' similarity to calculus in the ferret.

From these results and from others to be reported later it would seem that extreme caution should be exercised in interpreting tooth cavitation in the hamster as being analogous to human coronal caries arising in the enamel. This is not to decry the use of the hamster for dental research purposes, since for parodontal studies alone it is an animal of great promise. Indeed, it may be that some of the cervical and interstitial tooth cavities assumed to be of carious origin in man in fact result from parodontal disease, but much further investigation is necessary before this suggestion can be seriously entertained.

Summary

The relative incidence and distribution of dental cavities in hamsters are described, following experimental feeding of diets containing high proportions of refined and raw sugar.

In contrast to the findings of other workers, it was observed that the lesions arose in the cementum of the molar tooth roots, whence they progressed through the dentine to the pulp. Disintegration of the coronal dentine and enamel occurred as a secondary extension of the root cavities, and in no instance could primary cavitation of the enamel be established.

The lesions were associated with irritation and other disturbances due to penetration by calculus-like material and impacted food debris, and similar phenomena have been encountered in ferrets.

The differences between the hamster syndrome and enamel caries in man are discussed.

My thanks are due to Messrs. Tate and Lyle and especially to Mr. Philip Lyle and Mr. J. O. Whitmee, for the sugar supplies, and to Mr. H. C. E. Powers, their chief chemist, for the general sugar analyses; to Miss J. Lenz for the fluorine estimations; and to Mr. R Thorley for the histological preparations.

References

Arnold, F. A. (1942). *Publ. Hlth Rep., Wash.*, **57**, 1599.
Dale, P. P., Lazansky, J. P., and Keyes, P. H. (1944). *J. dent. Res.*, **23**, 445.
Granados, H., Glavind, J., and Dam, H. (1948). *Acta path. microbiol. scand.*, **25**, 453.
Hurst, V., Firsbie, H. E., Nuckolls, J., and Marshall, M. S. (1948). *Science*, **107**, 42.
Keyes, P. H. (1944). *J. dent. Res.*, **23**, 439.
King, J. D. (1944). *Brit. dent. J.*, **77**, 213, 245.
—— (1949). *J. Path. Bact.*, **61**, 413.
—— and Gimson, A. P. (1948–9). *Brit. J. Nutrit.*, **2**, 111.
—— and Glover, R. E. (1945). *J. Path. Bact.*, **57**, 353.
Langeron, M. (1933). *Précis de Microscopie*, 5th ed. Masson, Paris.
Lillie, R. D. (1948). *Histopathologic Technique*, p. 249. Blakiston Co., Philadelphia.
Mitchell, D. F., and Shafer, W. G. (1949). *J. dent. Res.*, **28**, 424.
Orland, F. J. (1946). Ibid., **25**, 455.
Shafer, W. G. (1949). *Science*, **110**, 143.
Sognnaes, R. F. (1948). *J. Amer. dent. Ass.*, **37**, 676.

HYPERCALCAEMIA DURING VITAMIN D TREATMENT OF RHEUMATOID ARTHRITIS

BY

H. St.C. C. ADDIS, M.B., B.Chir., M.R.C.P.

AND

R. D. CURRIE, M.B., Ch.B.

(From the University Rheumatism Centre, Manchester Royal Infirmary)

That excessive administration of vitamin D gives rise to toxic symptoms has been known since 1928, when their occurrence was reported in a baby treated with irradiated ergosterol (Hess and Lewis, 1928). Since that date many other reports have been published (Anning, Dawson, Dolby, and Ingram, 1948). The purpose of the present communication is to stress the dangers inherent in the employment of massive doses of vitamin D, the inadequacy of purely clinical control, and the absolute necessity for repeated laboratory control of such treatment. Two cases seen at the Rheumatism Clinic of the Manchester Royal Infirmary are reported in illustration of these points.

Case 1

A single woman aged 61 was admitted to the infirmary on September 8, 1949. She was extremely pale and apathetic, and complained of pain in the neck and knees with marked lack of energy.

After an attack of tonsillitis and erysipelas in 1942 she had developed a generalized polyarthritis accompanied by anorexia and loss of weight. Several courses of gold produced no improvement, and her condition remained unchanged until 1946. At this time some subjective improvement occurred following treatment from her doctor. Eighteen months before admission she first developed pain in the neck, which steadily increased in severity until it became her principal complaint. About this time she began to tire easily and to lose her appetite. These symptoms persisted up to the time of her admission to hospital, and were accompanied by loss of weight and by nocturnal frequency of micturition. The only significant point in the past history was "Bright's disease" at the age of 5 years.

On examination she was extremely pale and wasted. The skin was lax but the tongue moist. Subconjunctival calcification was present in both eyes. Pubic and axillary hair was scanty. Symmetrical tenderness and swelling were present in

the joints of the hands, wrists, and feet. Both knee-joints were painful and contained a moderate amount of fluid. Movement was restricted in the knees and cervical spine. There was slight enlargement of the heart, and a harsh systolic murmur was heard over the whole of the praecordium. The blood pressure was 220/90. Generalized muscle-wasting and weakness was accompanied by hypotonia. The deep reflexes and plantar responses were all present and normal. Tortuosity of the retinal arteries was seen on ophthalmoscopic examination. Routine urine examination showed a normal urine of low specific gravity.

Investigations revealed a normochromic anaemia, R.B.C. 3,490,000, haemoglobin 68%, and C.I. 0.97. The total white cell count was 10,600, the differential count being normal. The sedimentation rate was 82/100 mm. in the first hour. The excretion of 17-ketosteroids was 3.9 mg. in 24 hours. The urea clearance was 21% of the average normal. Radiographs of the hands and feet showed narrowing of the joint spaces and a diffuse osteoporosis. The combination of anorexia, hypotonia, and renal impairment suggested that the osteoporosis might be associated with hypercalcaemia.

Among other possibilities hypervitaminosis D was considered as a cause. Further inquiry disclosed that the patient had been taking calciferol in a dose of 200,000 i.u. daily for at least a year previously. On October 2 the serum calcium was 14.8 mg. per 100 ml., serum phosphorus 2.2 mg. per 100 ml., and the alkaline phosphatase 24 units. The latter finding did not, however, fit into the picture of hypervitaminosis D, and further radiographs were ordered so as to exclude hyperparathyroidism.

Even though she had ceased to take calciferol since her admission, her condition continued to deteriorate steadily, and it became impossible to maintain an adequate fluid intake by mouth. She became confused, disorientated, and progressively dehydrated. On October 6 the blood pressure had fallen to 140/65, the serum calcium being 15.3 mg. per 100 ml. and phosphorus 2.4 mg. per 100 ml. Radiographs of the skull and pelvis now revealed the changes typical of Paget's disease. For the next four days intravenous fluids were given, with the addition of 250 ml. of sodium citrate twice a day to combat the hypercalcaemia. After this it became possible, by special nursing, to maintain a fluid intake of 4 to 5 pints (2.3 to 2.8 litres) a day.

The serum calcium fell from 15 mg. per 100 ml. on October 12 to 12 mg. on the 17th. By this time, in view of the Paget's disease, the patient had been made to get up and sit in a chair, and was encouraged to start walking in the next few days, since Reifenstein and Albright (1944) have shown that the serum calcium rises to high levels in cases of Paget's disease immobilized for the treatment of a fracture.

A high fluid intake was maintained during the next month and the patient was kept ambulant; during this time her general condition improved considerably, particularly as regards her mental state. The urea clearance remained low.

She was discharged home, where her condition remained stationary during the next month, after which she was admitted to a bed in the chronic ward of another hospital.

Case 2

A man aged 68 was seen in the Rheumatism Clinic at the Manchester Royal Infirmary. He stated that since 1945 he had had intermittent pain and swelling of the hands, knees, ankles, and elbows, with pain in the neck, shoulders, and feet. He had had many different treatments, but no improvement. During the preceding year his appetite had become poor and he had lost weight. Six months previously he had had two attacks of diarrhoea lasting a few weeks. In the last month he had developed scalding on micturition and nocturnal frequency. He gave no relevant history of any previous illness.

On examination he was seen to be an elderly thin man, rather pale, who did not appear to be acutely ill. He had the typical clinical changes of an advanced rheumatoid arthritis in the neck, shoulders, elbows, hands, knees, and ankles. Arteriosclerosis was present in the peripheral arteries. The heart was not clinically enlarged, and the blood pressure was 240/120. Examination of the lungs, abdomen, and C.N.S. revealed nothing abnormal. The prostate was not enlarged. The B.S.R. was 39/200 mm., albuminuria was present, and the blood urea was 76 mg. per 100 ml. A radiograph of the hands showed advanced changes of rheumatoid arthritis in both hands.

The patient was considered to have uraemia, and was referred by his doctor to Professor R. Platt, at the Manchester Royal Infirmary, where the serum calcium was found to be raised to 12.8 mg. per 100 ml. and the blood urea to 94 mg. per 100 ml. As he had been taking calciferol in a dosage of 600,000 i.u. twice a week for about a year he was considered to be suffering from the effects of calciferol intoxication. No conclusion concerning the presence of previous renal impairment was arrived at.

Calciferol was discontinued and copious fluids were administered, but the patient died three weeks later.

Discussion

Vitamin D affects the absorption of calcium, its deposition in growing bone, and its excretion. The administration of large doses is followed, though not invariably, by a significant rise in the serum calcium level, and metastatic calcification is apt to occur in the kidneys, arteries, and elsewhere.

Among the earliest toxic symptoms of hypervitaminosis D are loss of appetite, fatigue, and pallor. As these are common constitutional manifestations of rheumatoid arthritis their significance when due to vitamin D may readily escape notice. Other common symptoms include thirst, nausea, vomiting, epigastric discomfort, headache, constipation or diarrhoea, and frequency of micturition. The tongue becomes dry, and the patient appears dehydrated, drowsy, and apathetic, finally sinking into coma.

Anning *et al.* (1948) pointed out that the total dose at the onset of symptoms varied from 1.4 to 35 million i.u. of vitamin D. There is also evidence to show that susceptibility may vary from time to time and in different seasons (McCance and Widdowson, 1942–3, 1943–4). Age is also a factor, children having a higher requirement than adults (McCance, 1947). Reed, Struck, and Steck (1939) have shown that there is an increased susceptibility to the toxic effects of calciferol in the presence of renal disease.

The detection of hypercalcaemia seems to be the best available indication of toxicity. Anning *et al.* (1948) suggest a level of diffusible serum calcium of 7.5 mg. or over per 100 ml. as indicating the "imminence of a toxic state." Although a significant rise of the total serum calcium usually occurs, many authorities doubt its reliability as a test (Reed, 1934; Slocumb, 1942). Furthermore, hypercalcaemia occurs in hyperparathyroidism, myeloma in about 50% of cases, skeletal neoplasm, and in conditions in which large parts of the skeleton are suddenly immobilized, as in anterior poliomyelitis (Duncan, 1947). In Paget's disease immobilization after a fracture may lead to dangerously high levels being reached (Reifenstein and Albright, 1944). This may explain why, in Case 1, in spite of the fact that the vitamin D was stopped, the patient continued to deteriorate while in bed and improved when she was made to do exercises and walk.

Consideration of published case records (Anning *et al.*, 1948) suggests that immediate withdrawal of vitamin D on the first indication of toxicity will, as a rule, result in a rapid disappearance of symptoms, though the blood calcium may remain high for several weeks. Similarly, though renal damage may occur before toxicity can be diagnosed, it is probably reversible if withdrawal is prompt (Slocumb, 1942). Frequent renal-function tests are therefore necessary.

Examination of the urine for albumin (Anning *et al.*, 1948) is an unreliable indication of renal impairment, being inconstant or absent in some cases.

Treatment consists in forcing fluids by mouth. Herrmann, Kirsten, and Krakauer (1949) have suggested the use of 250 ml. of sodium citrate 2.5% given intravenously four-hourly.

In view of the necessity for laboratory control the question arises whether the results of treatment of rheumatoid arthritis with massive doses of vitamin D are justified. In 1935 Dreyer and Reed reported improvement in the arthritic condition of two patients receiving massive dosage of vitamin D for hay-fever. This was followed by numerous reports, principally in the United States, of its use in rheumatoid arthritis. Though many claims for its curative value have been made, most observers have doubted its efficacy. The Council on Pharmacy and Chemistry of the American Medical Association (1939) concluded that "clinical evidence does not warrant the claim that massive doses of vitamin D are of benefit in chronic arthritis, in allergic conditions, or in psoriasis."

Summary

Two cases of toxicity due to massive dosage of vitamin D are described. The dangers of this form of therapy, particularly in rheumatoid arthritis, are pointed out, and the necessity for laboratory control is stressed.

We would like to thank Dr. J. H. Kellgren for permission to publish these cases and for his constant help and encouragement. Our thanks are also due to Professor R. Platt for allowing us to quote some of his findings in Case 2, and to Dr. M. D. Milne for helpful criticism.

REFERENCES

Anning, S. T., Dawson, J., Dolby, D. E., and Ingram, J. T. (1948). *Quart. J. Med.*, n.s. **17**, 203.
Council on Pharmacy and Chemistry and Council on Foods (1939). *J. Amer. med. Ass.*, **113**, 589.
Dreyer, I., and Reed, C. I. (1935). *Arch. phys. Ther.*, **16**, 537.
Duncan, G. G. (1947). *Diseases of Metabolism*, p. 208. Saunders, Philadelphia.
Herrmann, J. B., Kirsten, E., and Krakauer, J. S. (1949). *J. clin. Endocrinol.*, **9**, 1.
Hess, A. F., and Lewis, J. M. (1928). *J. Amer. med. Ass.*, **91**, 783.
McCance, R. A. (1947). *Quart. J. Med.*, n.s. **16**, 33.
—— and Widdowson, E. M. (1942–3). *J. Physiol.*, **101**, 44.
—— —— (1943–4). Ibid., **102**, 42.
Reed, A. M., Struck, H. C., and Steck, I. E. (1939). *Vitamin D.* Chicago. Quoted by Anning *et al.* (1948).
Reed, C. I. (1934). *J. Amer. med. Ass.*, **102**, 1745.
Reifenstein, E. C., jun., and Albright, F. (1944). *New Engl. J. Med.*, **231**, 343.
Slocumb, C. H. (1942). *Ann. intern. Med.*, **16**, 241.

The Staff Side of the Nurses and Midwives Whitley Council states that the Council is referring to the Ministry of Labour and National Service, for consideration by the Industrial Court, the question of revised salaries for public health and domiciliary district nurses and midwives, the Staff and Management Sides having failed to agree on the matter. In June last year increased salaries were agreed for the lower grades of hospital nurses, and in July the Staff Side put forward proposals for public health and domiciliary nurses which would have had the effect of maintaining the existing relationship between the salaries of the public health nurses and those of the hospital nurses, on which those of the public health nurses had previously been based. Similar proposals on behalf of domiciliary midwives were submitted in September, 1949. In February this year the Staff Side was informed by the Management Side that it was unable to agree to any revision of the salaries of public health and domiciliary nurses and midwives. In view of the serious anomalies which the Management Side's decision created the Staff Side asked that the matter should be referred to the Industrial Court for arbitration.

POLIOMYELITIS IN CORNWALL IN 1949

BY

E. R. HARGREAVES, M.A., M.D., D.P.H.
Deputy Medical Officer of Health, Cornwall County Council

During 1949, 110 cases of poliomyelitis occurred in Cornwall, giving an incidence of 0.3 per 1,000 of the population, a little less than double the rate for England and Wales in 1947. The age distribution over the county as a whole was normal—namely, approximately one-third under school age, one-third 5 to 14, and one-third 15 and over. Distribution of the first 100 cases is shown in Fig. 1.

It will be noted that there are four main centres of infection in the county, Camborne–Redruth, Penzance, Fowey, and Truro. It is interesting to compare this distribution with that of 1947 and to note that areas most affected in that year were relatively free of the disease in 1949.

The Camborne–Redruth outbreak was the first in the county; indeed, other than Newhaven, it was the first group of cases in the country. On June 21 three cases of paralysis were notified in Illogan, a village some four miles from Redruth. During the subsequent two months 21 further cases occurred in the Camborne–Redruth Urban District, and one at Truro School. An interesting feature of this small outbreak was the age group affected, 56% being under 5 years old.

The outbreak was for some time confined to the village of Illogan, and it seemed certain that the source of infection was close at hand. Of the three initial cases, two were pupils at the Illogan Infants' School, and the other, a child of 3, had an elder sister there. Careful investigation of the food supply and hygiene of the school together with the movements of staff and pupils failed to uncover any possible origin of the outbreak.

Consideration was given to the possibility of the importation of the virus from outside, but no visitors had stayed in any of the affected houses during the previous six weeks, nor had the occupants been away on holiday. Two old cases of poliomyelitis were known to be present in the district, but as it was two years since they contracted the disease the possibility of their still carrying the virus seemed remote.

Five more cases occurred in Illogan, all intimately connected with the school, four being pupils; the fifth, a child of 2½, had a brother at the school.

From Illogan the disease spread to Camborne and Redruth, Truro, and St. Day. When peripheral spreading occurs it is usually fairly easy to trace the origin of the first case. In Redruth, for instance, a case was notified on June 29, and on June 30 two boys in an adjoining house developed paralysis. The two families had gone by bus to Portreath beach on June 20 and again on June 21. The bus route is through Illogan, and many children from the village had joined the bus.

The first case in Camborne was admitted to the Iso'ation Hospital on July 8. The patient was a cousin of an Illogan case, and his aunt, in spite of warnings, had visited his home on two occasions, the last being eight days previously.

One solitary case was reported from Truro School; the boy developed paralysis on July 12, the infection being possibly contracted on June 25, when he went to a large religious meeting at Gwennap Pit, near St. Day, and subsequently spent the evening in Redruth.

Two cases occurred in St. Day; both had had indirect contact with Illogan.

At Fowey the outbreak started with a burst at the beginning of August, when five children developed paralytic poliomyelitis within 48 hours of one another. Again it was the pre-school children that suffered, four of the five cases being under 5 years of age. The area M.O.H. investigated this outbreak in great detail but could find no common factor. The water supply was extremely low at the time, but reports proved satisfactory. The boiling of water and milk was advocated.

The stage seemed set for a serious outbreak, but only three more cases occurred in the town, all developing paralysis two weeks later. One was an indirect contact through her sister with a previous case. The interval was 16 days, which allowed time for the virus to become established in the sister although she developed no symptoms suggestive of abortive poliomyelitis. The other two cases were close contacts, both working in the local chemist's shop.

It is fascinating, but often extremely difficult, to trace the origin of outbreaks such as occurred at Fowey. One felt that some connexion with the Camborne–Redruth cases probably existed, and searched accordingly; but in mid-August a letter from Dr. A. M. McFarlan, of Cambridge, told of a clerk from Cambridge and her fiancé who visited Polruan for their holiday on July 24, leaving again on August 9. While there the son of the hotel proprietor was ill for two days with symptoms suggestive of abortive poliomyelitis, and within a few days of returning to their homes—the girl to Cambridge, her fiancé to Scunthorpe—both these visitors developed paralytic poliomyelitis.

Polruan, the "Penpoodle" of Sir Arthur Quiller-Couch's *Troy Town*, is in reality a part of Fowey, being separated from the main portion of the town by the River Fowey.

A visit unearthed the history of two further visitors to Polruan who developed poliomyelitis after returning home, the earliest date being June 27, six weeks before the onset of the Fowey cases and approximately the same date as the beginning of the Illogan outbreak, some 40 miles away.

A violent focus of infection appeared in the city of Truro (population 12,950) at the beginning of September. Two cases of paralysis were reported on September 11, and in the subsequent 10 days 12 more patients were admitted to the County Isolation Hospital.

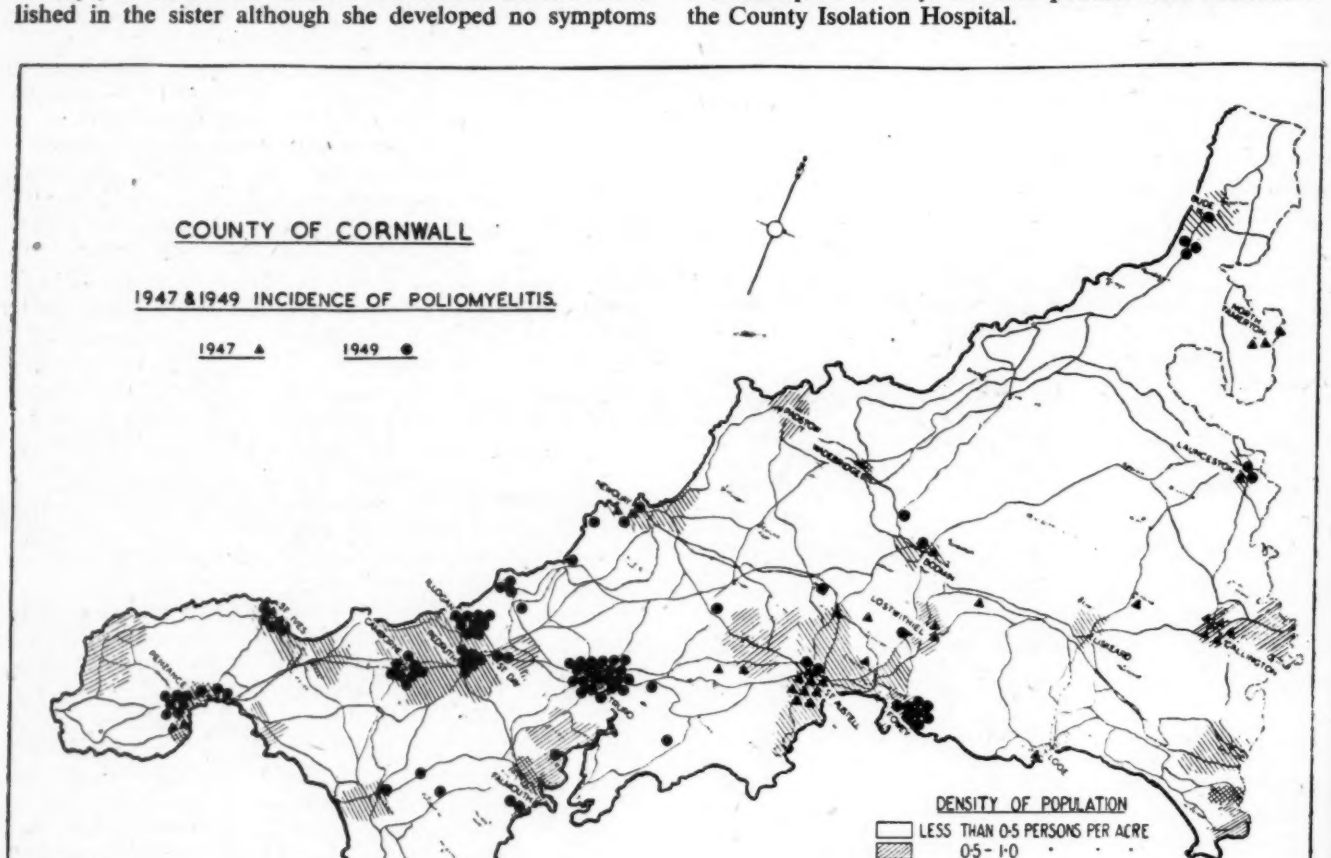


FIG. 1.—Distribution of cases of poliomyelitis occurring in Cornwall in 1947 and 1949.

In all, some 20 cases occurred in Truro and a further seven in the surrounding villages. Paralysis was severe, particularly in early cases, four of which proved fatal.

Double cases occurred in two families, one of which is extremely interesting. A man aged 27 was taken ill on September 9 and died two days later of respiratory paralysis. He had been working at considerable pressure for several weeks organizing the local shopping week and the R.A.F. "Battle of Britain" activities. There are three other siblings in the family, all grown up, but they happened to be at home at the time of his illness. A brother, a naval officer attached to Plymouth, was in Truro on a week's leave, and assisted in nursing him. He returned to Plymouth and went down with a mild attack of poliomyelitis on September 30. An unmarried sister helped in the clerical

work of the family business and had been in close contact with the brother who had died. She was taken ill on September 25 and developed paralysis of all four limbs with diaphragmatic involvement on September 29. The remaining brother, also in the Navy, was unaffected.

This family illustrates the highly infective properties of poliomyelitis virus and familial susceptibility to the disease.

Two cases in this series are of interest as a study of immunity.

A woman was delivered of her second child on September 1. Apart from slight pyrexia on the 14th the puerperium was uneventful. She was up in the house from September 15 to 19, but did not feel very fit. On the 20th she was feverish, with nausea and headache. Next day she was no better, and as the baby was also off colour and feverish it was decided to begin artificial feeding. The mother remained in bed until September 28, when on getting up she first noticed a weakness in her left leg, which proved to be due to poliomyelitis. As regards the baby, artificial feeding was easily established, but on September 25 and 26 it had four convulsions, and subsequently developed some weakness in the muscles of the shoulder girdle.

The other case, that of a woman expecting her second baby, developed severe paralysis three days before confinement. The baby arrived on the appointed day without undue difficulty. It was normal at birth and has remained perfectly well.

Cases in outlying areas could again be traced to contacts with the main outbreaks.

An isolated case which occurred in a neighbouring town is of interest. A nurse at the Royal Cornwall Infirmary, Truro, was on duty in the children's ward, where there were cases of poliomyelitis transferred after their stay at the Isolation Hospital. Her parents live at Perranporth and she goes there for her day off, staying the night at home, where she shares a bedroom with her stepsister, a girl of 6½. She was at home on September 18, and nine days later her stepsister was kept away from school because of fever, headache, and vomiting. On September 29 the child developed paralysis of all four limbs. The incubation period fits well with the visit of her stepsister on September 18 (11 days before paralysis), and no other possible source of infection came to light. If we accept this we must also accept the possibility that the nurse was a carrier and was presumably infected while nursing cases at the Royal Cornwall Infirmary, all of which had been in the County Isolation Hospital for at least three weeks, and which on present standards are regarded as non-infectious.

During investigations of the Truro cases special attention was given to the possibility that the disease had followed the ingestion of a contaminated aliment. Milk, ice-cream, and food supplies provided no common factor.

Owing to exceptionally dry weather the normal source of the city water supply had proved inadequate, and the local company had been compelled to draw from a heavily polluted stream, the River Allen. At the pumping station the water is passed through precipitation tanks (aluminium hydroxide) and thence to pressure sand filters. Finally it is chlorinated and allowed to stand in a small service reservoir, but during peak periods the water passes direct to the mains after chlorination. Two samples taken on September 24 from taps in the town showed serious pollution, typical *Bacterium coli* counts being 180 and 50. The chlorination plant in use at the time was abandoned and superchlorination with an electric injector instituted. In addition, the medical officer of health advised the boiling of all drinking-water in the city. Within five days of superchlorination the epidemic ceased. In the subsequent month only one further case occurred—that of a man who developed mild facial paralysis on October 17. The paralysis rapidly receded, but an increase of globulin and protein in the cerebrospinal fluid was suggestive of poliomyelitis.

Age Group	Cornwall (110 Cases)	Illogan Area (25 Cases)	Truro Area (27 Cases)
0–4	38%	56%	22%
5–9	25%	28%	19%
10–14	6%	—	7%
15+	31%	16%	52%

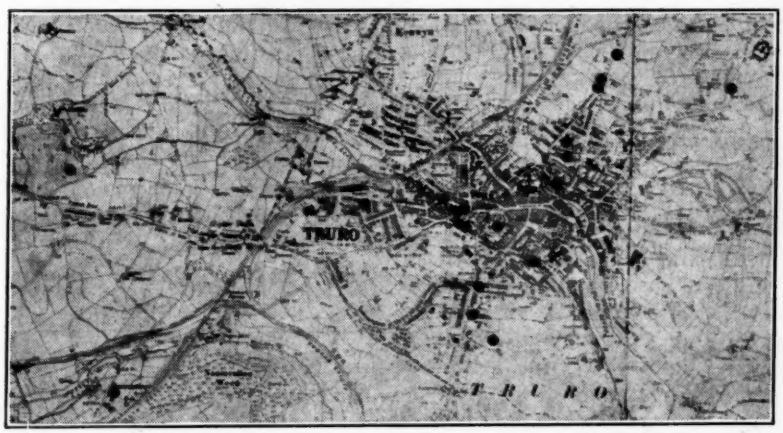


FIG. 2.—Map of Truro showing the sporadic distribution of cases of poliomyelitis in the city.

The outbreak in Truro presents certain interesting features: (1) The high age group attacked: the accompanying table shows the age groups of cases in Cornwall as a whole compared with those of the local outbreaks at Illogan and Truro. It will be noted that 52% of the Truro patients were over 15 years of age. (2) A history of direct or indirect contact with previous cases was remarkable for its absence. (3) The cases were evenly distributed over the town (see map, Fig. 2). (4) The explosive nature of the outbreak and abrupt cessation after superchlorination of the city's water supply (Fig. 3).

Discussion

Following early work on monkeys, the theory of droplet spread of poliomyelitis virus and entry through olfactory mucous membrane was accepted by most authorities and handed down in medical textbooks for some 20 years. In more recent years (Harmon, 1937; Trask *et al.*, 1938;

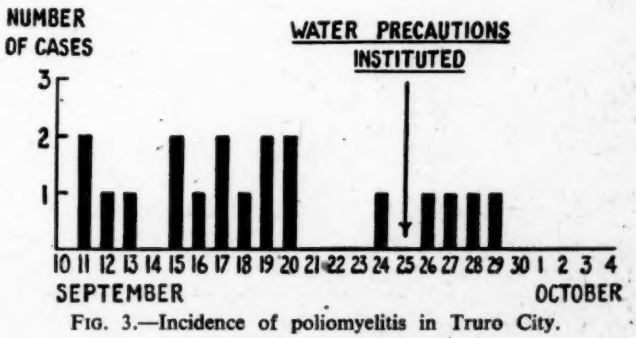

NUMBER OF CASES
WATER PRECAUTIONS INSTITUTED
3
2
1
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4
SEPTEMBER
OCTOBER

FIG. 3.—Incidence of poliomyelitis in Truro City.

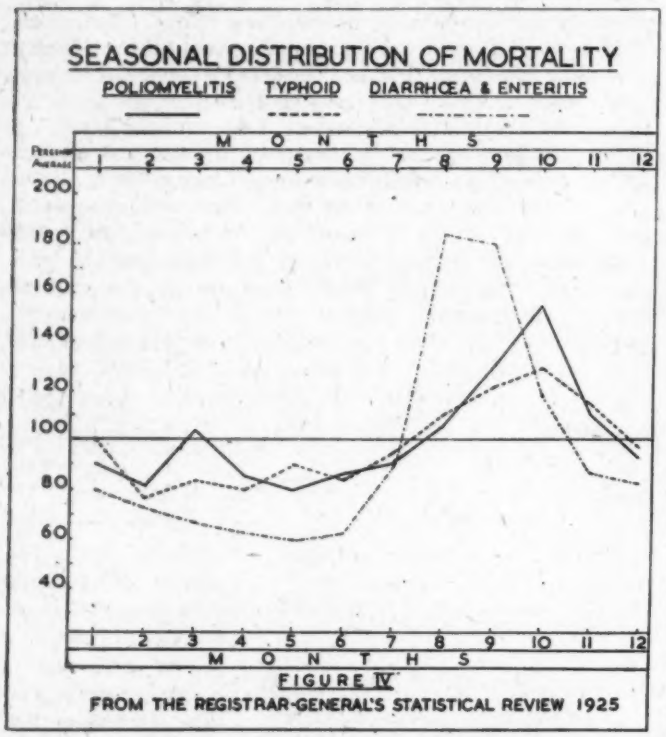


FIG. 4.—Graph of seasonal mortality from poliomyelitis, typhoid, and diarrhoea and enteritis, 1921–5. Deaths per day in each month are expressed as a percentage of deaths per day throughout the year.

Horstmann *et al.*, 1944) the alimentary canal has been regarded as the more probable route of infection.

There is now almost overwhelming experimental evidence that the alimentary canal rather than the olfactory mucous membrane is the common route of infection in man. The monkey can be infected only through the nasal mucosa; it is extremely resistant to poliomyelitis virus, and the olfactory mucous membrane is a weak spot in the armour of both monkey and man against virus infection.

If the nerve endings of the olfactory mucous membrane are blocked the monkey resists infection by all routes. Chimpanzees are more susceptible than monkeys, and in addition to nasal spray can readily be infected by feeding the virus.

In man, although pathological changes in the central nervous system are widespread, lesions in the lumbar enlargement of the cord are by far the most common, next in frequency being those in the cervical enlargement. The pathology is in agreement with the clinical findings, paralysis of the lower limbs being more frequent that that of all other parts of the body by three to one, and impairment of bladder function is a common symptom in the early stages of the disease.

It is true that at necropsy there is usually some degree of meningeal congestion, but if an experimental animal is killed in the pre-paralytic stage, when symptoms of irritation alone are present, there is no meningitis, yet even at this early stage the motor cells in the anterior horn show signs of degeneration (Hurst, 1929).

In droplet infections it is the nasal, not the oropharyngeal, carrier who is of danger to the community (Hamburger and Green, 1946; Cook and Ashman, 1949), yet the virus of poliomyelitis has seldom been recovered from nasal washings; nor was Sabin (1947) able to recover it from the masks of five early severe paralytic patients who for 30 minutes had talked, coughed, and blown into them.

That ample opportunity exists for the infection of man by the alimentary canal is no longer in doubt. The virus is widely scattered among contacts and excreted in the stool (Gordon *et al.*, 1947).

Both in America and in South Africa virus has been isolated from sewage during epidemic periods and for some months after the appearance of the last case (Paul, Trask, and Gard, 1940; Gear and Mundel, 1946). Food and drink can therefore readily become contaminated at times of epidemics. The virus is able to retain its virulence outside the body for considerable periods—for example, in butter for as long as 90 days (Kling *et al.*, 1931) and in milk for some weeks (Landsteiner *et al.*, 1911)—and it can be recovered from water after three months. Nor is the virus readily killed by chlorine. Kempf and Soule (1940) and Kempf *et al.* (1942) found that under laboratory conditions adapted so far as possible to conform with natural methods of water purification the virus was still active after sedimentation and subsequent exposure to 0.5 parts per million free chlorine for four hours.

More recent work (Lensen *et al.*, 1946) suggests that the figure of Kempf *et al.* is too high. The present position is well summarized by Professor Maxey (1949), who states: "While further carefully controlled studies are desirable, on the basis of experimental results now available, it appears to the author that the application of chlorine under conditions which will insure the maintenance of 0.2–0.3 p.p.m. free available chlorine residuals after one-half hour of contact may be sufficient to inactivate the quantities of poliomyelitis virus that might be present in a potable water."

The seasonal curve of poliomyelitis is remarkably regular, the incidence beginning to rise in June and reaching its peak in August, September, or October. The disease normally dies out with the advent of colder weather,

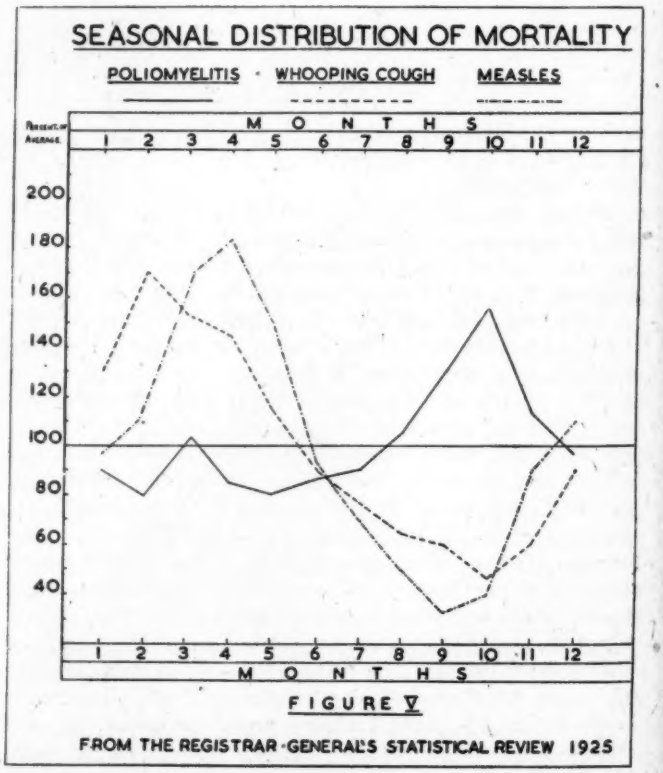


FIG. 5.—Graph of seasonal mortality from poliomyelitis, whooping-cough, and measles, 1921–5. Deaths per day in each month are expressed as a percentage of deaths per day throughout the year.

although winter outbreaks are not unknown. The curve is thus similar to that of intestinal diseases such as enteric fever or gastro-enteritis, and is in marked contrast to accepted droplet infection such as measles and whooping-cough (see Figs. 4 and 5).

It has been noted that outbreaks of poliomyelitis often occur during abnormally hot weather: a graph of the incidence of poliomyelitis in Cornwall, 1911–49, plotted against the average mean daily temperature recorded at Falmouth for the third quarter of the year, shows that the incidence of the disease has risen above 0.05 per 1,000 on six occasions. These six epidemic years include four of the five highest mean average temperatures recorded for the third quarter in the span of years under consideration (1911, 1921, 1947, and 1949), and the other two epidemic years (1919 and 1945) show an abnormally high August temperature.

Some will argue that at Illogan the epidemiological findings I have recorded suggest droplet infection, as most of the cases were in close contact at school, but it should be remembered that in such a closed community up to 80% of the pupils will be excreting virus, and it is thus easy for children's hands to become contaminated.

The findings at Truro—namely, the shift to an older age group, the sporadic distribution of cases in the city, the lack of any history of contact, the explosive nature of the outbreak together with its sudden cessation with the adequate superchlorination of the water—are suggestive of water-borne infection. No known abortive cases had been reported in Truro before the outbreak, but as a number of paralytic cases had occurred in the surrounding country—particularly Redruth, which is only nine miles away—it is likely that many carriers existed in the neighbourhood, and contamination of the city's emergency water supply, the intake for which was located in meadows used by children as an unofficial playground, was therefore probable. Unfortunately it was not possible to prove the presence of virus in the water by animal passage, but circumstantial evidence was strong enough to warrant superchlorination and boiling of water for domestic use.

Summary

A description is given of the severe epidemic of poliomyelitis which occurred in Cornwall during 1949 (incidence 0.3 per 1,000 of the population), and it is noted that the areas most heavily attacked in that year are among those which escaped the disease in 1947.

Individual cases of interest are those of two expectant mothers who developed poliomyelitis at or about the date of their confinement. In the one, severe paralysis developed four days before delivery, labour was normal, and the baby was unaffected. In the other, paralysis was first noticed 28 days after confinement. The baby, who was breast-fed, had symptoms suggestive of pre-paralytic poliomyelitis three weeks after birth, followed four days later by convulsions, and now has a slight residual weakness of the muscles of the left shoulder girdle.

An exceptionally severe outbreak occurred in the city of Truro (population 12,950), where 20 cases were notified in the short space of 18 days. The high age group of these patients, their sporadic distribution in the city, the lack of history of contact between cases, together with the sudden cessation of the outbreak after superchlorination of the water supply, known to be contaminated, suggest water dissemination of the virus.

The evidence in favour of intestinal spread of poliomyelitis is briefly discussed; the marked dissimilarity between the seasonal incidence curve of the disease and that of known droplet infections, together with the finding that recorded epidemics of poliomyelitis in Cornwall have been associated with exceptionally hot weather in the third quarter of the year, lends support to this mode of spread.

I wish to thank Dr. R. N. Curnow for his encouragement and for affording me the facilities for carrying out the investigations, the District M.O.H.s for their assistance, Dr. W. H. Bradley for his helpful criticism of this paper, and Dr. F. D. M. Hocking and Sister E. M. Keeling for kindly reproducing many of the diagrams.

Bibliography

Cook, G. T., and Munro-Ashman, D. (1949). *British Medical Journal*, **1**, 345.
Gear, J. H. S., and Mundel, D. (1946). *S. Afr. med. J.*, **20**, 106.
Gordon, F. B., Schabel, F. M., Casey, A. E., Fishbein, W. I., and Abendrath, M. (1947). *Proc. Inst. Med. Chicago*, **16**, 123.
Hamburger, M., and Green, M. J. (1946). *J. infect. Dis.*, **79**, 33.
Harbitz, F., and Schell, O. (1907). *Dtsch. med. Wschr.*, **33**, 1992.
Harmon, P. H. (1937). *J. Amer. med. Ass.*, **109**, 406.
Horstmann, D. M., Ward, R., and Melnick, J. L. (1944). Ibid., **126**, 1061.
Hurst, E. W. (1929). *J. Path. Bact.*, **32**, 457.
Kempf, J. E., and Soule, M. H. (1940). *Proc. exp. Biol., N.Y.*, **44**, 431.
—— Wilson, M. G., *et al.* (1942). *Amer. J. Publ. Hlth*, **32**, 1366.
Kling, C., Levaditi, C., and Lépine, P. (1931). *Bull. Acad. Méd., Paris*, **106**, 245.
Landsteiner, K., Levaditi, C., and Pastia, C. (1911). *Ann. Inst. Pasteur*, **25**, 805.
Lensen, S. G., Rhian, M., and Stebbins, M. R. (1946). *J. Amer. Water Works Ass.*, **38**, 1069.
Local Government Board (1912). Special Report No. 61. Epidemic Poliomyelitis. London.
Maxey, F. (1949). *J. Amer. Water Works Ass.*, **41**, 696.
Paul, J. R., Trask, J. D., and Gard, S. (1940). *J. exp. Med.*, **71**, 765.
Registrar-General (1925). Statistical Review of England and Wales. London.
Sabin, A. B. (1947). *J. Amer. med. Ass.*, **134**, 749.
Trask, J. D., Vignec, A. J., and Paul, J. R. (1938). Ibid., **111**, 6.
Wickham, I. (1907). *Acute Poliomyelitis*, New York, 1913. (Translated by Moloney.)

Medical Memoranda

Necrosis After Penicillin

In the case described below aseptic necrosis followed intramuscular injections of penicillin; the condition was associated with thrombophlebitis and severe constitutional disturbance. In view of this experience it is suggested that persistent burning pain at the site of penicillin injections may indicate an idiosyncrasy and make it inadvisable to continue injections.

Case Report

A woman aged 33 with moderately severe glandular and pulmonary tuberculosis was admitted to Harefield Hospital for assessment of her fitness to continue pregnancy. A large glandular swelling developed in the right side of the neck, associated with a leucocytosis of 18,700 (87% polymorphs) and pyrexia. Penicillin injections of 500,000 units in 2 ml. of sterile distilled water six-hourly were started. Most injections were made into the front of the thighs and some into the gluteal muscles. Despite the inclusion of a little 1% procaine in each injection, burning pain was experienced, and redness of the skin and induration resulted. The temperature did not fall, and penicillin therapy was abandoned after five days.

Ten days after the beginning of treatment fluctuant swellings developed in the muscles of both thighs and there was a tender indurated swelling in one buttock. The white cell count was then 30,500 per c.mm. (90% polymorphs). Both thighs were incised and pus was obtained from them. Aerobic and anaerobic cultures of the pus were persistently negative. Fluid from the necrotic tissue was injected into two guinea-pigs intraperitoneally and subcutaneously and neither showed post-mortem evidence of tuberculosis.

The legs continued painful; pus oozed from the wounds, and the surrounding soft tissues were hot and tense, with oedema of the skin and of the legs below the knees. Further

surgery was considered inadvisable. A week after incision of the thighs spontaneous abortion occurred, three days later thrombophlebitis was observed in both antecubital veins at the site of vein punctures, and three days after that left foot-drop occurred. The white cell count was then 38,400 per c.mm. (92% polymorphs). After a further 12 days the skin sloughed in both legs over a circular area of 5 in. (12.5 cm.) diameter in the left leg and 2 in. (5 cm.) diameter in the right; the patient was apyrexial and free from pain. Separation of the sloughs and slow epithelization occurred, the foot-drop recovered, and the white cell count fell to 8,100 per c.mm. Procaine and penicillin intradermal sensitivity tests were negative.

I am indebted to Dr. K. R. Stokes, Medical Director, Harefield Hospital, Middlesex, and Dr. J. C. Roberts for permission to publish this case.

W. R. MAY, M.B., B.S.

Adrenocorticotrophic Hormone in Acute Disseminated Lupus Erythematosus

A case of acute disseminated lupus erythematosus is here presented, and its response to treatment with adrenocorticotrophic hormone described.

CASE REPORT

A married woman aged 21 was admitted to hospital on November 28, 1949. She had had no serious illness, but had always been highly strung. Leucodermia was first noted at the age of 6. She gave a month's history of malaise, sweats, fever, and simultaneous painful swelling of the knees, wrists, and proximal interphalangeal joints of the hands. A fortnight before admission a rash appeared over the bridge of the nose and forehead.

On examination she was found to be apprehensive and dyspnoeic on the slightest exertion. Fever was present (100°–102° F.—37.8°–38.9° C.). A papulo-erythematous rash was present over the nose, forehead, and cheeks. The lips were fissured. A painless, shotty enlargement of the glands in the cervical triangles, suboccipital region, and axillae was noted. The spleen was just palpable. The joint condition had subsided. Leucodermia of the trunk and limbs was present.

Her condition steadily deteriorated; and by the end of December the rash, which had in parts become purpuric, eczematous, and encrusted, had spread to involve most of the face and the external surfaces of the pinnae. The scalp and circumoral region were spared. An extensive, painful shallow ulceration of the buccal and pharyngeal mucous membranes had developed. Numerous rhonchi were present in the chest. A patch of exudate and a fresh haemorrhage had appeared in one fundus. There was albumin in the urine. Her fever was swinging from 100 to 104° F. (37.8 to 40° C.) and she appeared very ill.

Leucopenia was present (1,400 per c.mm.—P. 44%, L. 53%. M. 3%; 2,550 per c.mm.—P. 56%, L. 44%); blood haemoglobin at the end of December had fallen to 48% (Haldane); the red cells numbered 2,450,000 per c.mm. (colour index 1), and the platelets 650,000 per c.mm. The value for serum proteins was albumin 2.7 g.%, globulin 1.8 g.%.

The urine repeatedly showed albumin but no casts or red cells. Radiographs of the chest revealed no abnormality. An electrocardiogram showed normal tracings with a sinus tachycardia of 132 a minute. The blood Wassermann and Kahn reactions were negative. The Paul–Bunnell reaction was positive only to a titre of 1 in 8. A throat swab showed no K.L.B. or Vincent's organisms. Three attempts at obtaining bone marrow by aspiration failed. A seven-day course of intramuscular penicillin (60,000 units three-hourly) had no effect of any kind.

On January 8, 1950, A.C.T.H. therapy was begun—5 mg. intramuscularly six-hourly for five days. A dramatic change occurred: the temperature moderated to between 98 and 101° F. (36.7 to 38.3° C.), subjective improvement was remarkable, the appetite returned, and there was a marked euphoria. Fourteen days after the beginning of A.C.T.H. the oral mucous membrane had completely healed, and the facial rash had been entirely replaced by sound and supple skin which showed pigmentation corresponding to the previously affected parts and a fine superficial branny desquamation. Albuminuria, retinal haemorrhage, and, later, the exudate disappeared. The leucopenia gave way to a polymorphonuclearcytosis (14,250 per c.mm.—P. 96%. L. 4%). Serum proteins were not greatly affected (albumin 2.5 g.%, globulin 2.3 g.%; albumin 2.9 g.%, globulin 2 g.%)

Efforts were made to maintain the improvement by the six-hourly injection of 5 min. (0.3 ml.) of 1 in 1,000 adrenaline, and later by the intravenous injection of T.A.B. (1 million rising to 10 million organisms) at four- to five-day intervals. Despite these measures the fever gradually increased, and after six weeks a return of the facial erythema was noted. Much of the hair of the head has fallen, and the patient is now nearly bald. Leucopenia has reappeared (3,800 per c.mm.—P. 84%, L. 15%. B. 1%). The serum proteins remain unaltered (albumin 2.6 g.%. globulin 2.1 g.%).

COMMENT

The diagnosis of acute disseminated lupus erythematosus is supported by the age and sex of the patient, the preceding history of joint pains, the nature of the rash, the fever, splenomegaly, retinopathy, albuminuria, anaemia, and leucopenia. No striking cardiological abnormalities have been noted. Such are not essential to the diagnosis. Guion and Adams (1943) report six cases that went to necropsy. endocarditis occurred in only one, and this was not diagnosed clinically.

It is of interest that no eosinophils were seen in seven successive white cell counts on this patient, and that we were unsuccessful in obtaining bone-marrow smears despite three separate attempts. Thorn, *et al.* (1949) found a similar eosinopenia in two out of their three cases, and ascribed this to a bone-marrow hypoplasia rather than to excessive adrenocortical activity.

Descriptions of the beneficial effects of A.C.T.H. in acute disseminated lupus erythematosus have been given by Thorn *et al.* (1949) and Elkinton *et al.* (1949). These reports are fully borne out in our case. Subsequent attempts to stimulate the anterior-pituitary–adrenal-cortical system by injections of T.A.B. and adrenaline were disappointing. The initial improvement has not been maintained, and the long-term treatment of this patient has yet to be worked out

We are greatly indebted to Dr. W. J. Tyndall, of Organon Laboratories, Ltd., for supplying the A.C.T.H. used in this case.

D. G. FERRIMAN, D.M., M.R.C.P.,
Physician, North Middlesex Hospital.
R. B. N. WILSDON, M.B., M.R.C.P.,
Registrar, North Middlesex Hospital.

REFERENCES

Elkinton, J. R., *et al.* (1949). *J. Amer. med. Ass.*, **141**, 1273.
Guion, C. M., and Adams, E. C. (1943). *Amer. J. med. Sci.*, **205**, 33
Thorn, G. W., *et al.* (1949). *New Engl. J. Med.*, **241**, 529.

The annual report (1949) of the department of rheumatic diseases of the West London Hospital is a well-produced booklet containing much information of value. In the introduction Dr. W. S. C. Copeman discusses the work of the department. The relative incidence of rheumatic diseases was the same as in the previous year—osteo-arthritis 30.7%, rheumatoid arthritis 16.4%, non-articular rheumatism 29.4%, lumbar disk protrusion 5%, other conditions 18.5%. The most important event of the year was the establishment of a research unit within the department, and a team has been formed to undertake clinical investigation of steroid and other substances allied chemically to "cortisone." The report contains a number of papers on subjects connected with rheumatism, including three on cortisone and A.C.T.H.

Reviews

CONGENITAL HEART DISEASE

Congenital Malformations of the Heart. By Helen B. Taussig, M.D. (Pp. 618; 46 plates; 177 figures. £3 10s.) New York: The Commonwealth Fund. London: Geoffrey Cumberlege.

Dr. Taussig has earned an enduring reputation in connexion with congenital malformations of the heart by her brilliant pioneer work with Dr. Alfred Blalock on the surgical treatment of cyanotic heart disease. For this reason alone any book from her on this subject must command attention and respect. In this volume, which will inevitably become a classic medical work, she shows that her knowledge of her subject is profound and has been acquired from a very critical and careful clinical and radiological study of a volume of material that must be far greater than that seen by any other living cardiologist. Her experience before the introduction of the Blalock–Taussig operation was considerable; it must now be immense. In this book we are privileged to share with her the fruit of this wide and deep knowledge.

In addition to an exposition of the many types of congenital malformations, most chapters are completed by helpful illustrative case notes. A full and useful bibliography is also included. The book is profusely illustrated and contains many good diagrams, including coloured charts to show the vagaries of the circulation in the various conditions. Of special value are the radiographs, which draw attention to the outstanding part played by radioscopic investigation of these difficult cases.

The chapter on pure pulmonary valvular stenosis will almost certainly be entirely rewritten in a new edition, and the one on the Eisenmenger complex will doubtless be amplified and altered. Similarly, the absence of an adequate account of angiocardiography and of cardiac catheterization will need to be rectified. These are not so much omissions or errors as an indication of the very great advances that have been rapidly made during the last two to three years. The great increase in experience and knowledge that has come with the development of surgical treatment means that a new edition will be inevitable. It will be eagerly looked for, and no doubt when it appears our debt to Dr. Taussig will thereby be further increased. One of the penalties of success is that it leads to further toil. The book is indispensable to all workers in this subject, and should be read as a textbook or consulted as a work of reference by all those who wish to know more of congenital cardiac malformations.

R. C. BROCK.

THE TECHNIQUE OF INTESTINAL INTUBATION

Intestinal Intubation. By Meyer A. Cantor, M.S., F.A.C.S. (Pp. 333; illustrated. £2 15s.) Oxford: Blackwell Scientific Publications.

During the last fifteen or twenty years the mortality rate for intestinal obstruction has fallen from 60 to 16%, and it is generally agreed that the improvement has been, in the main, because of intestinal intubation. Until recently those who wished to gain information about this method of treatment have had to look up original articles, but in future this book will enable them to obtain all the details they wish with the minimum of trouble. Here will be found descriptions of the various tubes in common use, an account of the anatomy and physiology of the parts concerned, and particulars of the conditions for which the treatment is indicated. The technique is described in detail and the possible dangers recounted.

I must confess that I had not even imagined several of the complications which have been known to follow the introduction of the long intestinal tube. The tube may become tied into a spontaneous knot, or the distended head may itself cause intestinal obstruction. The author gives directions for avoiding or correcting these complications. There is a useful chapter on the various methods of suction which can be used, with comments on the merits of each, and a section describes the use of the intestinal tube in infants.

The two final chapters give the results of research into the permeability of the balloons of these tubes to the gases which are found in the intestine. This section (in which the author has collaborated with Mr. Everett Phelps and Mr. Robert Esling) should be of great interest to physiologists as well as to clinicians. There are 224 references at the ends of the chapters and over 500 references in a bibliography at the end of the book. Readers of the *Journal* will be interested to know that the latter list includes even an answer to "Any Questions?" given on November 24, 1945. But I wish that the price of the book was less than 55s.

ZACHARY COPE.

TEXTBOOKS OF DERMATOLOGY

Histopathology of the Skin. By Walter F. Lever, M.D. (Pp. 449; 221 illustrations, 8 in colour. 75s.) Philadelphia and London: J. B. Lippincott Company. 1949.

The Common Diseases of the Skin. By R. Cranston Low, M.D., F.R.C.P.Ed., F.R.S.Ed., and G. A. Grant Peterkin, M.B.E., M.B., F.R.C.P.Ed. Fourth edition revised. (Pp. 282; 148 illustrations, 9 in colour. 21s.) Edinburgh: Oliver and Boyd. 1949.

Histopathology of the Skin has been prepared primarily for dermatologists, who will welcome it warmly. It is of reasonable size, well written, and attractively planned. The text is accurate, and there is a wealth of excellent and adequate photomicrographs in black and white, and a few coloured illustrations. Much thought has been given to the method of presentation, and the student will appreciate the apparent simplicity which characterizes the result. There is a brief introductory section on the normal anatomy and histology of the skin and of the types of cells which infiltrate the corium in inflammatory dermatoses. A short note is added on laboratory methods.

A paragraph on the essential clinical features and a discussion of the histogenesis of many dermatoses add greatly to the interest and value of the work without disturbing its balance. The full lists of references at the end of each section will be appreciated also. There is an avoidance of unnecessary detail in description and of reference to outmoded interpretations. The author seems to have avoided to a great extent the confusion in terminology which is the regular accompaniment of any publication of dermatology.

Among the few departures from common usage in this country is the term "basal-celled papilloma" for seborrhoeic wart, and it would seem to merit acceptance. The section on epithelial tumours is excellent, and the inclusion of an article on fungous diseases and an admirable chapter on metabolic disorders add to the completeness of the work. Not only the dermatologist but the pathologist and the general physician will find much of interest and of value in the volume.

Dr. Cranston Low died before the fourth edition of his handbook came into print. In Dr. Grant Peterkin he

found an able colleague who would probably agree with Dr. Low that "in teaching one must be dogmatic." *The Common Diseases of the Skin* is easy to read, the illustrations are excellent, and details of the local treatment advocated by the authors are carefully emphasized. The book describes only the common affections and is rich in good clinical descriptions. It will be particularly appreciated by those who have attended the lectures on which the work is based.

The authors are not afraid to express unorthodox views and to support them with arguments. They state that psoriasis and keloids are probably infective in origin and that acne vulgaris is contagious; the association between erythema nodosum and tuberculosis is explained on the basis that either the tuberculous child is more susceptible to infection with erythema nodosum or that the latter disease, like measles, predisposes to tuberculous infection. It is surprising to find such disorders as lichen planus, ichthyosis, leucoderma, scleroderma, pompholyx, hyperidrosis, hypertrichosis, summer eruptions, and lupus erythematosus described together in one chapter. Arsenic is still advocated in the treatment of many affections, including psoriasis, and sulphur is given as the treatment of choice in scabies. The value of this concise and vigorous presentation of the subject to the student would be enhanced if he was urged not only to examine the whole skin but the whole patient. There is perhaps a tendency to divorce dermatology from general medicine.

J. T. INGRAM.

MEDICINE FOR NURSES

Lectures on Medicine to Nurses. By A. E. Clark-Kennedy, M.D., F.R.C.P. (Pp. 288; 27 figures. 15s. 6d.) Edinburgh: E. and S. Livingstone. 1950.

This book contains 18 lectures given to the nurses at the London Hospital by Dr. Clark-Kennedy. The author's plan is to "inculcate an attitude of mind" and leave "some lasting conception of the nature of the patient and the meaning of his or her disease." There is no attempt to cover the whole of medicine or to condense the students' textbooks.

On reading these lectures I feel that it must have been a real pleasure to have sat as a nurse in the audience—she was not burdened with a mass of factual knowledge, which is of so little value in her subsequent work. The subjects described include acute rheumatism, old age, nephritis, diseases of the lungs, anaemia, jaundice, diet, and disease, and an interesting account of the desperately ill patient. The lecture on "unconsciousness" is most helpful. Glycaemia is strangely described as being Latin for sugar in the blood; and, judging from the number of mistakes, the proofs appear to have been inadequately read.

G. E. BEAUMONT.

A NEW ZEALANDER LOOKS BACK

The Reminiscences of a Physician. By Bernard Myers, C.M.G., F.R.C.P. (Pp. 159. 10s. 6d.) New Zealand: A. H. and A. W. Reed. London: H. K. Lewis and Co.

Dr. Bernard Myers has evidently had a happy as well as a useful and successful career. He comes of a family of New Zealand pioneers, and one of the most engaging features of this book is his pride in the country of his birth, which is equalled almost by his loyalty to the Old Country. He graduated at Edinburgh, and started practice in London after a final year at Bart's and an interesting and uncomfortable experience of midwifery practice at the Coombe Hospital in Dublin. His description of his pioneer work at the Children's Clinic in Marylebone in co-operation with colleagues from various hospitals is well done. During the existence of the clinic he made the acquaintance of many distinguished people.

Dr. Myers has obviously the gift for making friends, as is shown by his record of stage and other celebrities he has known, including members of the Savage Club. He paid several visits to his homeland, and to me the most interesting chapters of the book are those describing the scenery, people, and customs of New Zealand, with affectionate references to the Maoris. During both wars Dr. Myers played a prominent part in the hospitals for New Zealand casualties, and for ten years, from 1937, was Commissioner for the N.Z. Red Cross. I feel sure this book will be read with pleasure by the author's many friends here and overseas.

A. COX.

Casualty Faking, by Ernest James Ward (pp. 36; 4s.; London: British Red Cross Society, 1949), is a well-illustrated monograph which should interest all first-aid instructors who wish to give their classes something more interesting than formal lectures. Though some first-aid teachers have been demonstrating on "faked" casualties for many years, this method did not come into general use until the recent war, when many instructors, weary of giving interminable lectures, welcomed it as a useful and entertaining diversion. Certainly very realistic effects can be obtained without much special knowledge. The members of one first-aid party, which gave demonstrations of light rescue work to Army officers during the war, staged such "horrific" demonstrations and rehearsed the actors so thoroughly in their parts that they considered their work ill-done if there was not a rapid thinning of the audience due to epidemic syncope. Teachers of first-aid who would like to enliven their practical demonstrations in this way can learn how to do it from this book. Theatrical cosmetics, which can be easily removed, are the most important item in the make-up box, and with a little practice almost every injury commonly met with can be realistically reproduced.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

The Physical Phenomena of Mysticism. By M Summers. (Pp. 263. 21s.) London: Rider. 1950.

The Sulphonamides. By F. Hawking, M.D., and J. Stewart Lawrence, M.D., M.R.C.P. (Pp 389. 42s.) London: H. K. Lewis. 1950.

The British Encyclopaedia of Medical Practice. Medical Progress 1950, and Cumulative Supplement, 1950. Edited by Rt. Hon. Lord Horder, G.C.V.O., M.D., F.R.C.P. (Pp. 1,030. 35s. 32s. 6d. to subscribers to main work. 50s. with Cumulative Supplement.) London: Butterworth. 1950.

Diseases of the Foot. By E. D. W. Hauser, M.S., M.D. 2nd ed. (Pp. 415. 35s.) Philadelphia and London: Saunders. 1950.

Clinical Pathology. Application and Interpretation. By B. B. Wells, M.D., Ph.D. (Pp. 397. 30s.) Philadelphia and London: Saunders. 1950.

Medical State Board Questions and Answers. By R. M. Goepp, M.D., and H. F. Flippin, M.D. 8th ed. (Pp. 663. 35s.) Philadelphia and London: Saunders. 1950.

Postgraduate Gastroenterology. Edited by H. L. Bockus, M.D. (Pp. 670. 50s.) Philadelphia and London: Saunders. 1950.

Electrocardiography. By L. Wolff, M.D. (Pp. 187. 22s. 6d.) Philadelphia and London: Saunders. 1950.

A Textbook of Dental Anatomy and Physiology. By R. C. Wheeler, D.D.S., F.A.C.D. 2nd ed. (Pp. 422. 35s.) Philadelphia and London: Saunders. 1950.

Collected Reprints of the Department of Ophthalmology, West China Union University College of Medicine and Dentistry, 1938 to 1945. (Pp. 282. No price.) Chengtu, Szechwan: West China Union University. 1950.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY APRIL 15 1950

ENVIRONMENT AND HEREDITY

The elucidation of the relationship between inheritance and environment as factors in human development, whether antenatal or post-natal, proceeds but slowly. The statement of Professor H. S. Jennings that "what heredity can do, environment can also do," has offered the clinician some hope that it might one day be within his power to prevent those disturbances of organogenesis which result in a host of congenital abnormalities. The recognition that a trivial infection like rubella in the mother during the first four months of pregnancy may determine the development of such deformities in her baby as cataract, deafness, microcephaly, and cardiac disease has strengthened such hopes and stimulated world-wide investigation. The day of successful prophylaxis is not yet, but it is much nearer than seemed possible a few years ago. If this has been a gain for the forces of environment, the powers of heredity have also been demonstrated in a different quarter. It has been shown by electroencephalographic studies that some behaviour disorders in children are related to constitutional cerebral dysrhythmia, and difficulties which had been too easily assumed to be the result of adverse environmental influences in the home may now be accepted as not implying a fault in anyone. Parents are thus relieved of their burden of guilt, and both the paediatrician and the family doctor can now tackle the physical problem as objectively and as patiently as they handle epilepsy. The practice of medicine does not become easier as it becomes more scientific, and as another reminder of the importance of multiple aetiological factors in the pathogenesis of disease comes the suggestion that both mongoloid idiocy and kernicterus may arise from the interaction of both genetic and environmental influences.

Professor Norman Capon discusses these and related subjects in his scholarly and stimulating Charles West Lecture, which is published elsewhere in this issue. He is particularly concerned that the child whose function is in any way deranged should be assessed as an individual—as a person with a body mechanism, with an intellect and emotions, with family and social relationships, at work and in play. This is an important philosophic concept of twentieth-century medicine, and Professor Capon does well not only to emphasize it but also to recognize that it is even more difficult to apply to the child than to the adult. When a picture has been formed of the child's development and behaviour in all these aspects it is still necessary to decide whether the derangement from the average is of quantitative importance, whether it is constitutional or acquired, whether it can be affected by therapy, and whether such treatment would be wisely applied. As a simple example of such difficulties Professor Capon surveys the usefulness of the measurement of height, weight, and body build in children in the assessment of the physical and nutritional status of the individual child. Many observers have pointed out that height is no sound index of maturation and that bone age, as determined by radiography, gives a much closer correspondence with sexual maturity. These disorders of growth and weight are the simplest and most clear-cut of all developmental problems: they are the daily preoccupation of a children's out-patient department, and yet they often present diagnostic and therapeutic difficulties. Why is this boy below average height, and should he be given testosterone? Is the factor in this girl's obesity constitutional, endocrine, or emotional, and should a carbohydrate-restricted diet be imposed upon her? Is this child's failure to gain weight due to infection, fatigue, or emotion, and how may it be corrected?

Much of the lecture is devoted to disorders of emotional behaviour and to functional nervous disorders, and this reflects the great incidence of such troubles in paediatric practice to-day. Professor Capon joins with other observers in attributing these disorders to a lack of leadership, affection, and security in the home, and he notes the relationship of child neurosis to the broken marriage of the parents. He observes with "something of a shock" that such subjects occupied very little space in nineteenth-century textbooks, and he concludes that insufficient attention was then given to the emotional development of children. This is probably true, but one cogent reason may well be that these disorders were not nearly so common then as they are to-day. Nor is this surprising when one recalls the quality of Victorian family life. The literature of this century abounds with descriptions of all classes of Victorian homes, and, although in it there is much complaint of rigidity of moral code, or narrowness of religious practice, and of harshness of discipline, there is no suggestion of absent leadership, of imperilled security, or of affection denied. The Victorian knew where he was going, and he knew where he wanted his children to go. It can be safely assumed that the current textbooks gave a true picture of the relative rarity of these behaviour disorders in the children of that day.

The environmental hazards for children, as for adults, change with each generation. The behaviour disorders of to-day have taken the place of the deficiency diseases of yesterday, and the perils of infectious disease have given way to the accidents on the road and to the dangers

in the home by burns and scalds. Moreover, the neglect of yesterday becomes the hazard of to-day. The transfusion of rhesus-negative girls and women with rhesus-positive blood has increased the mortality and morbidity from icterus gravis in their babies, and the failure to provide adequate sanatorium accommodation in the last generation has resulted in the present high rate of tuberculous infection in young children. It is more than likely that by our ignorance, by neglect, or by error we are busily making some new risk for the children of to-morrow.

AN INSTITUTION AND AN OFFICE

Lord Moran made known during the past year his decision that this would be his last year of office as President of the Royal College of Physicians of London. He was first elected P.R.C.P. in 1941, a year before the publication of the Beveridge Report and of the Draft Interim Report of the Medical Planning Commission of the B.M.A. He was elected at a time when he had assumed the great personal responsibility of acting as physician to Mr. Churchill during the war of 1939–45. This exceptional responsibility during this epochal moment of our history was fittingly recognized by the country when Sir Charles Wilson was elevated to the peerage as Lord Moran of Manton in 1943. The Royal College of Physicians has during the past 400 years had its periods of stagnation. It used to be a very close corporation for safeguarding the privileges of practice in London enjoyed by its Fellows. In recent years, under the wise guidance of that great medical statesman the late Lord Dawson of Penn, the College of Physicians has widened its field of vision. Lord Moran came into office as P.R.C.P. at a time of great ferment in medical thinking on the problems of the organization of the services the profession renders to the public. The B.M.A. had thoroughly prepared the ground by the publication in 1938 of its revised proposals for a general medical service for the nation, and by its vigorous exploration of controversial territory in the work of the Medical Planning Commission. The part played by the Royal Colleges in the agitated discussions preceding the introduction of the N.H.S. was discussed freely and critically, especially in the correspondence columns of this *Journal*. If there remains any resentment on this score it is a resentment directed at that precious heritage of the British conception of democracy—the freedom to give expression to thought in speech and writing without fear or favour.

Lord Moran has been a controversial personality on the medical stage. His great gifts as an orator have been added to skill in administration and a courage to pursue courses known at the time to be unpopular. Easy popularity he has not sought. The path of conciliation is one he may not always have found it easy to follow. Yet by force of character, tenacity of purpose, and hard work he has during the past nine years made an indelible mark on the Royal College of Physicians and has been a powerful influence in determining the destiny of the medical profession. That each year from 1941–9 the Fellows of the College elected Lord Moran as their President is in itself the kind of tribute that he himself would most appreciate.

Dr. W. Russell Brain, elected as by custom on the first Monday after Palm Sunday the new President of the College, brings to this high office different qualities and younger shoulders on which to bear the heavy burden. A search into the archives of the College would probably show that he is the youngest in a long line of Presidents. A distinguished neurologist, he has shown by his delightful incursions into philosophy and letters that he lives up to the Greek ideal of the comprehensive man and is himself acutely sensible of what the Master of Trinity has called "the multiform workings of the human mind." He possesses what Osler considered to be the necessary attribute of the physician, imperturbability, a quality which has been unequally shared by his predecessors. It is good indeed that the College has as its President one who is first of all a clinician, for, if the College stands for anything, it stands for the excellence of clinical medicine practised at its best in this country. Its true function is to further and sustain the art and science of the practice of medicine, and to the extent that it departs from this high aim to that extent will its stature diminish in a profession which looks upon it as a monumental carrier of what is most precious in our traditional life. Through its vagarious course of 400 years the Royal College of Physicians has nevertheless represented the continuity of our medical history. As a profession we wish to see it hold fast to what is good. In the past few years some have awaited with anxiety the possibility that this Leviathan might flounder in ponds too small to hold its majestic form, when its proper course is to swim with dignity on the broad oceans of the medical commonwealth. These things are the concern of Medicine and not merely of the College. It has a local habitation and a name, but it is possessed not by itself but by the medical profession. It is part of our heritage, and as medical men and women we are as jealous of its fair name and proper dignity as it is itself.

Such reflections are provoked not by a change in the presidency of the College—though this of itself is an important enough event—but by the changing fortunes and patterns of the medical profession. The N.H.S. Acts of 1946 and 1947, though an inevitable consequence of the N.H.I. Act—a fact often ignored—brought about a revolution in medical life. Yet in the

broad stream of Medicine these Acts are but part of the ebb and flow of history. If Medicine could recuperate with vigour from the attacks of Henry VIII, it can in the long run remain unruffled by the Celtic fervour of any other succession of Welshmen. The Celtic fringe has its ineffable charm, but it remains a fringe. The garment of Medicine—if we may translate the metaphor from water to land—is many-coloured and variously woven. But it is of one piece—or, in the stilted modern parlance, it is, or should be, integrated. To divide this garment into many pieces, or to attempt to do so, is to disintegrate, to divide, to produce a thing of shreds and patches. As a profession we are made of one cloth, and in the making general practitioners, consultants, specialists, the minders of the public health, the research workers, pathologists—and the administrators—are an indivisible team of co-partners in a great enterprise. If this house of medicine is united it cannot fall or fail. A trend to dissociate general practitioners from their colleagues in consultant and specialist practice has not gone unobserved. A trend to minimize the undramatic but fundamental contribution of the public health service to protecting the collectivity from the individual source of infection is visible. The ancient and primitive function of childbirth is in danger of becoming the close preserve of the selected few who form the most embryonic of our corporate institutions. Variety in unity must be the aim, but with the emphasis on unity. And if such reflections are stirred by the election of a new President of the Royal College of Physicians of London this is, perhaps, a sign of the times in which we live, and indicates reaction to the multiple antigens injected into the medical body politic.

Dr. Russell Brain assumes office not at a time of acute conflict but at a time when what is needed more than anything else is the integration of the medical nervous system. He has the advantage over his eminent predecessor of having worked on the committees of the British Medical Association and so of knowing its virtues as well as its weaknesses. It may be hoped that under his guidance the Royal College of Physicians will recognize that in the microcosm of Medicine there is a proper and economical partition of functions. To the Royal Colleges in England and Scotland the medical profession looks for inspiration in academic discipline. To the B.M.A. doctors look for constructive action in what is vaguely but usefully called "medical politics," not forgetting that in modern times politics is closely correlated with economics. What is above all needed now is a harmony of interests, a unity of aim, a co-ordination of activities, a removal of apathy. The times in which we live offer a challenge, and perhaps it is a sign of the times that the Royal College of Physicians has chosen as its President a neurologist who has sought inspiration in those humane studies which encourage even the most hardened misanthropist to believe that man is something other than an articulate ape.

ACUTE PERFORATION OF PEPTIC ULCERS

The natural history of a peptic ulcer must depend on the balance between those factors which facilitate its formation and those which favour healing. Careful study of the period immediately preceding an acute perforation might be expected to reveal evidence of the aggravating factors which have assisted the ulcer-forming process to overcome the strong natural tendency towards healing. Small acute ulcers which heal are probably common. The problem of peptic ulcer is really the problem of why some ulcers fail to heal and even get bigger. The paper by Drs. C. Strang and I. O. B. Spencer appearing elsewhere in this issue, though mainly negative, underlines the difficulty of such studies. The authors did not discover any relation between the time of perforation and the last meal, which suggests that perforation is not associated with a special phase of digestion. There was no correlation with walking, sitting, or lying down. Perforation does, however, occur more frequently in the afternoon and evening than in the morning. It was less common in the summer-holiday months than in the winter.

The authors' results conform to the same general pattern disclosed in the much larger survey by Illingworth, Scott, and Jamieson[1] (later elaborated by Jamieson[2]). Unlike the Scottish workers they did not find a lower incidence on Sunday and Monday, but the Newcastle series is by comparison relatively small and could with advantage be continued. The evidence suggests that fatigue may be a possible factor precipitating acute perforation. In this connexion it may be recalled that Illingworth and his colleagues found that the striking increase in acute perforations in 1940–1 preceded the period of bombing and could not be attributed to the immediate psychological effects of bombardment. The increase corresponded with the period of great industrial activity after Dunkirk—with very long hours of work often followed by civil-defence duties. The effect of fatigue on gastric function is a subject worth studying, and it would be interesting to work out the time at which acute perforations occurred among men on night duty.

Strang and Spencer studied the frequency of unusual causes of worry in their patients and found only 33 out of 189 who confessed to employment, housing, and domestic difficulties preceding perforation. This is a much lower figure than that reported by Davies and Wilson[3] in their carefully conducted investigation: they

[1] *British Medical Journal*, 1944, 2, 617, 655.
[2] Ibid., 1947, 2, 289.
[3] *Lancet*, 1939, 2, 723.

found that 16 out of 25 patients with perforation gave a history of some outstanding event preceding the perforation and capable of producing acute emotional stress. The time interval was usually a matter of days. All clinicians will have seen examples of haemorrhage or perforation after an acute emotional upset in a patient with peptic ulcer, but the exact frequency of this precipitating factor is still in doubt. The patient with an ulcer is often unusually sensitive and may feel bitterly resentful or humiliated or may suffer acute emotional tension from an episode which many others would quickly forget, even if it troubled them at all. The difficulty is, therefore, to find the disturbing influence, and unless it is obviously extraordinary, such as death, bankruptcy, or divorce, it may easily be missed even by an interested clinician. It is essential to win the confidence of the patient, and the facts brought to light during the interview of surgical patients by medical registrars not otherwise concerned with their treatment are probably not comparable with the very detailed case studies made by Davies and Wilson. It is likely that the true frequency of significant nervous stress preceding acute perforation lies between the figures recorded by the Newcastle and London observers. Further studies are needed of gastric and duodenal ulcer separately.

The sex incidence of acute perforations differs from the sex incidence of uncomplicated ulcers, and in the Newcastle series the ratio of men to women patients was 14.8 : 1. The usual finding is a ratio of approximately 4 : 1. It appears that not only is peptic ulcer less common in women but the liability to perforation is considerably less than in men. The high male-to-female ratio is due to the much greater number of men with duodenal ulcer. Duodenal ulcers which perforate are almost all anterior-wall ulcers, whereas the posterior ulcers tend to bleed. It is possible that duodenal ulcers in women do not perforate—though they may bleed—because their ulcers may be less likely to develop on the anterior wall of the duodenum. This is a further point which needs to be clarified.

POLIOMYELITIS AFTER IMMUNIZATION

Since diphtheria immunization was undertaken on a large scale a few cases of paralysis after injection of alum-precipitated toxoid (A.P.T.), of pertussis antigen, or of both antigens combined have been reported. The question had then to be decided whether these were cases of brachial neuritis such as have been known to occur after other injections or whether they were cases of true poliomyelitis. In a paper in last week's *Medical Officer* Dr. D. H. Geffen discusses an investigation of these occurrences in London.[1] The inquiry arose out of the notification of two cases of poliomyelitis in children aged 10 months who had been immunized with combined A.P.T. and pertussis vaccine two or three weeks previously. Out of about 180 cases of poliomyelitis occurring in London in children under 5 during the first nine months of 1949, thirty had been immunized against diphtheria or against diphtheria and whooping-cough within the previous four weeks (in 21 cases a combined vaccine was used, which, in Dr. Geffen's opinion, causes more local irritation than other reagents). In itself this would be no remarkable coincidence, but it was also observed that the paralysis did not fall into the general pattern seen in patients of the same age group who had not been recently immunized, but affected in particular the limb which had been injected. The facts reported in this paper do not of themselves provide decisive proof that the injection was the precipitating cause of the paralytic poliomyelitis, but they do suggest there is a prima facie case for investigation.

The starting-point of an investigation reported in the current issue of *Archives of Disease in Childhood*, by Dr. J. K. Martin, was rather different.[2] He examined 17 children in whom there appeared to be an association between intramuscular injections and flaccid paralysis of one limb. The materials injected, between 3 and 26 days before the onset of the paralysis, included A.P.T., pertussis vaccine alone or combined, T.A.F., and in two cases penicillin. Since in almost every case a diagnosis of poliomyelitis was made Martin compared the annual incidence of poliomyelitis in England and Wales with other reports of paralysis following injections. This series of 67 provides evidence that these cases occur chiefly when there is a high prevalence of poliomyelitis. The seasonal incidence also conforms closely to that of poliomyelitis. Though he admits that the relationship between inoculation and paralysis has not been proved statistically, Martin goes so far as to suggest that it might be wise to suspend inoculations during part of the year or in areas where poliomyelitis is prevalent.

The same relation of prophylactic immunization to the onset of poliomyelitis has been observed in Australia during an epidemic of poliomyelitis in Melbourne. It was decided to inquire for a history of immunization in the course of routine investigations of all reported cases, and McCloskey[3] has recently published the result of this inquiry. There were 31 cases of poliomyelitis in children from 1 to 15 years of age who had had some kind of prophylactic inoculation during the preceding three months. Among those patients who had received either pertussis vaccine or this combined with A.P.T. there can be no doubt that there was a significant relation between the limb paralysed and the site of injection. With the A.P.T. alone the association was less obvious, but it was apparent when attention was confined to

[1] *Med. Offr.*, 1950, 83, 137.
[2] *Arch. Dis. Childh.*, 25, 1.
[3] *Lancet*, 1950, 1, 659.

those cases which had been immunized within the previous month. It is inconceivable that the virus was present as a contaminant in the vaccine, and indeed the same batches of vaccine were being used without harm in other parts of Australia where there was no poliomyelitis epidemic. It is improbable that the virus was being transferred from patient to patient by faulty syringe technique, despite the fact that it is a common practice to use the same syringe to inoculate a number of persons. A much more likely explanation is that the local tissue damage caused by the injection had affected, by some kind of local axon reflex, the neurones of the nerves supplying this area. These hypersensitive neurones might prove a weakness in a patient who at the time was infected with the poliomyelitis virus and who in the normal course would have overcome the infection without the development of signs of the disease.

One inference which could be drawn from McCloskey's evidence is that a state of hypersensitivity to paralytic poliomyelitis develops about the seventh day after immunization; it is localized to the limb injected and reaches its height about the eleventh day. On this hypothesis the injection would have very much the same effect as severe muscular effort in converting a silent infection into paralytic poliomyelitis. An alternative view is that the immunization had not increased the susceptibility of the patient to poliomyelitis but only modified the pattern of paralysis in a patient who would have succumbed to the disease in any case. It is noteworthy that there is no evidence that immunization has been a precipitating cause of poliomyelitis in America. Other investigations into the alleged association between poliomyelitis and recent immunization are being carried out, and even if the results should confirm the Australian work and the prima facie case put forward by Dr. Geffen there will be no reason for irresponsible pessimism. It is well known that there are other factors which can increase susceptibility to paralytic poliomyelitis—for example, it is not now considered wise to carry out tonsillectomy when poliomyelitis is prevalent. A dispassionate assessment of the relative risks can be made only when the full facts are known.

DRUG TREATMENT OF PERIPHERAL VASCULAR DISEASE

The drugs which can cause dilatation of the normal limb vessels increase steadily in number. On the whole their application has been in the diagnosis rather than in the treatment of peripheral vascular disorders: a consideration of the pathology of the common disorders of the blood vessels of the limbs explains their therapeutic limitations. When organic sclerosis is present the most that can be expected from vasodilator drugs or sympathectomy is an opening up of smaller collateral channels in which the sclerotic process is less advanced. Even in those cases in which vascular spasm is a major factor the results obtained from drugs are likely to be disappointing; for, while the surgeon can limit his operation to the section of nerves supplying the affected vessels, the action of vasodilator drugs is bound to be widespread and indiscriminate. This applies to the nitrites and nicotinic acid, whose vasodilator action has long been recognized as too violent and transient. It also applies to the newer drugs which antagonize the sympathetic nervous system, whether, like the tetraethyl-ammonium compounds and hexamethonium and pentamethonium iodide (whose properties were recently described in this *Journal* by Burt and Graham[1]), they do this by blocking the transmission of impulses through sympathetic ganglia, or, like "dibenamine," they exert their adrenolytic effect peripherally by competing with adrenaline for cell receptors in the vascular wall. The ability of these sympathetic-blocking agents to lower the blood pressure can be used to advantage in treating the hypertensive patient in bed, but it bars their use in the ambulant patient with peripheral vascular disease.

That this assessment of "chemical sympathectomy" as a practical therapeutic measure may be too gloomy is suggested by Dr. A. H. Douthwaite and Dr. T. R. L. Finnegan's paper which appears in this week's *Journal*. They recount their experience with benzyl-imidazoline. This drug is one of a number of imidazoline derivatives which were first investigated by Hartmann and Isler[2] in 1939. Most of these compounds have a vasoconstrictor action, but the benzyl derivative is a powerful vasodilator which, under the name of "priscol," has been widely used in the U.S.A. since the war. It is generally described as an adrenolytic and sympatholytic agent and has been said to have no action on vessels deprived of their sympathetic nerve supply. Douthwaite and Finnegan have investigated its action in normal subjects and in patients with Raynaud's disease, hypertension, intermittent claudication, and rheumatoid arthritis. (The popularity of sufferers from this last disorder as subjects for investigation mounts steadily.) After giving a "test dose" of 25 mg. of priscol by mouth to exclude the unusually sensitive patient—whose response is described as "priscol shock"—they used a standard dose of 50 mg. by intravenous injection. The skin temperature and, by inference, blood flow were measured by attaching thermo-electric coupling junctions to the index fingers and big toes. In the normal subject transient flushing of the face and neck was followed by a rise in the skin temperature of the extremities which lasted from 50 to 90 minutes. The fact that the rise in temperature was greater in the toes than in the fingers suggests that the drug exerts its greatest effect on vessels with a high vasomotor tone, and this is well confirmed by the results in the four cases of rheumatoid arthritis. In these patients the temperature of the fingers, which was originally lower than that of the toes (the reverse of normal), rose to a correspondingly greater height after administration of the drug: there was no lasting clinical improvement.

The most gratifying therapeutic success was obtained in the cases of Raynaud's disease: in addition to the immediate relief of symptoms, a single injection, by appearing to break a vicious circle, kept the patients symptom-free for hours or days. An attempt to prolong the effect by giving

[1] *British Medical Journal*, 1950, 1, 455. See also leading article on p. 474.
[2] *Arch. Exp. Path. Pharmak.*, 1939, 192, 141.

a maintenance dose of 25 mg. of priscol four times a day by mouth was partly defeated by the inability of half the patients to tolerate this dose—the unpleasant side-effects being palpitation, flushing, and giddiness. Some overcame the difficulty by taking the drug for a day or two at a time, for even a short course relieved symptoms for a period of up to two weeks. The authors condemn the use of the drug in hypertension, since intolerance occurred with doses below that required to alter the blood pressure. In the cases of intermittent claudication (24 of arteriosclerotic origin, 2 due to thromboangiitis obliterans) the results were less good, though it was successful in relieving ischaemic night pain and in accelerating the healing of trophic ulcers.

THE LABORATORY'S ANSWER

It was an excellent idea of the Medical Research Council to bring together field workers and laboratory workers in conference (see p. 898), if only to make the field workers better able to propound their questions to the laboratory and laboratory workers more appreciative of the exigencies of the field. In a candid exposition of the laboratory point of view, Dr. John Barnes, director of the Council's Toxicology Research Unit, referred to the new chemical compounds which are constantly appearing and the questions naturally asked about them—whether the substance is toxic, how ill-effects may be avoided or alleviated, and, especially, what will be the result of repeated, long-continued exposure. The answer must often be "Not known" or very long delayed. The question whether the continued ingestion or absorption of small quantities of material over years will have any deleterious effect is probably the most important question which is asked of the laboratory, especially when it concerns the toxicity of food and other consumer articles; yet it is one of the most difficult to answer. Dr. Barnes said that it was possible to demonstrate toxic reactions in experimental animals fed on a diet containing a certain amount of a questionable substance and to infer that similar doses would be harmful to man. But the difficulty lies in naming permissible concentrations in food or other articles to which young and old, sick and healthy, may be exposed for years. There is an absence of standards in animal experiments with which apparent deviations from a supposed normal can be compared. A question is easy to ask; to construct an experiment within the terms of the question may be a little more difficult, but it may be quite impossible to interpret the results of the experiment so as to answer the question. Nevertheless Dr. Barnes declared that he and his fellow workers are not discouraged and still hope to provide answers to some of the questions in more roundabout ways. He added a complaint about the lack of balance shown in much industrial research. The organic chemist turns out more and more compounds in the hope of producing the perfect chemotherapeutic agent or the perfect insecticide or whatever it may be, while the amount of information about all these new compounds steadily decreases. It would be better to spend more time and effort on finding out how the most promising compounds work so that a more intelligent approach may be made to the construction of new ones.

SMALLPOX

An outbreak of variola major, such as that which has broken out in Glasgow (see "Epidemiological Notes" on page 914), is news, because it betokens a breach in our defences and the establishment of a focus of infection by a disease, lethal yet preventable, to which the majority of the population are susceptible. During the 15 years which have elapsed since smallpox ceased to be endemic in the British Isles the disease has been imported on a number of occasions by sea or by air. Each invasion has been overcome—sometimes quickly, sometimes only after several months of anxiety lest endemicity might be re-established. Bradley[1] has outlined the routine measures of control after the importation of smallpox infection. These measures are based, in the first instance, on prompt recognition of the disease, on the removal of frank and suspected cases to a hospital reserved for this purpose and with staff already protected, and on the accurate identification, surveillance, and vaccination of all possible contacts. The difficulty here is the tracing of individuals who may have been in brief contact, such as in a train or bus, with a patient. If all contacts can be traced, vaccinated, and placed under surveillance there is less need to fall back on the second line of defence, mass vaccination, which has certain disadvantages and to which resort may be delayed until a stage is reached where the infection has passed beyond the bounds of strict control and is appearing outside the line of known contacts.

If an outbreak of smallpox is to be controlled accurate diagnosis is essential. It is plainly less harmful to suspect smallpox wrongly than to miss a diagnosis. Any patient recently returned from abroad who develops a rash should be suspected, no matter how trivial the illness may appear to be, and it should not be forgotten that smallpox modified by previous successful vaccination may present a picture greatly different from many textbook descriptions of the disease. The Ministry of Health has made it possible for medical officers of health to obtain the opinion of a consultant in any case of doubt, and, of course, the "virologists" are now able to offer useful help. Conybeare[2] has recently given an account of some of the findings of members of the Ministry's panel of smallpox consultants in cases in which smallpox was suspected but unconfirmed.

If the defences against smallpox are to be efficient they must be maintained during quiet periods when the danger seems remote. Guidance should be given to parents by general practitioners and at infant-welfare centres, and a serious attempt should be made to remedy the decline in infant vaccinations, the numbers of which, as Conybeare[3] has shown, have fallen by about one-half in England and Wales since the National Health Service Act came into operation. In the recently published annual report of the Ministry of Health the Chief Medical Officer estimates that during the second half of 1948 not more than 20% of infants received primary vaccination.[4]

[1] *J. R. sanit. Inst.*, 1947, **67**, 559.
[2] *Mon. Bull. Min. Hlth*, 1950, **9**, 56.
[3] Ibid., 1949, **8**, 204.
[4] *Report of the Ministry of Health for the Year Ended March 31, 1949.* London: H.M.S.O.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

MODERN VIEWS ON URAEMIA AND DEHYDRATION

BY

D. A. K. BLACK, M.D., M.R.C.P.
Lecturer in Medicine, University of Manchester

Uraemia and dehydration are not pathological entities but are syndromes with many possible causes. The presence of either is a sign that the mechanisms which conserve the composition and amount of body fluids have broken down. This may happen because the homoeostatic processes have failed, as in renal disease; or because a severe strain has been put on the regulating mechanism, as by intractable vomiting and diarrhoea. The two syndromes commonly occur together. The separation of uraemia and dehydration in the ensuing discussion is therefore to some extent an artificial one, but it can be justified by the fact that the symptomatic treatment of uraemia and dehydration is different, even though the pathological process underlying the two conditions may at times be the same.

Uraemia

Uraemia is a convenient term for the clinical and biochemical syndrome which arises when the kidneys are unable to excrete the end-products of nitrogen metabolism as rapidly as these are formed in the body. Although it is the retention of urea which gives the syndrome its name, it has been shown that urea is not itself a toxic substance, nor does its experimental administration reproduce the symptoms associated with the syndrome of "uraemia." The pathogenesis of the symptoms of uraemia remains obscure; retention of potassium, a low serum calcium, the alkalosis of vomiting or the acidosis of fixed acid retention, and changes in the osmotic pressure of body fluids—all these may play a part in different patients.

Particular confusion has arisen from the use of the term "acute uraemia" to denote the convulsive attacks which may complicate the course of acute nephritis. Here the essential lesion seems to be a spasm of cerebral vessels related to the rise in blood pressure, and nitrogen retention in this phase of nephritis is trivial and unrelated to the symptoms. Excluding this syndrome of "acute uraemia" as being quite different in nature from the other forms, we can still distinguish three types of uraemia, the aetiology and practical management of which are different: (1) the uraemia of acute renal failure, (2) the uraemia of chronic renal failure, and (3) so-called "extrarenal uraemia."

Acute Renal Failure

Suppression of urine may arise in many ways; in acute nephritis, in cortical necrosis, in calculous anuria, and as a sequel to the crush syndrome, mismatched transfusion, heavy-metal poisoning, or the administration of sulphonamides. It may be absolute, producing complete anuria, or relative in that appreciable amounts of urine are formed but nitrogen is still retained. Except as a rough approximation, it is impossible to give a volume of urine which is "adequate." Although healthy kidneys can excrete the body's metabolites in 500 ml. of urine a day, or even half that amount if the diet is low in salt and protein, this depends on their ability to produce a highly concentrated urine. Such a performance is impossible to the damaged kidney, and nitrogen retention may increase even though a litre or more of dilute urine is being formed daily. The renal failure of alkalosis is a good example of inadequate renal function in the presence of a "satisfactory" urine volume. Anuria or severe oliguria is therefore a certain sign of renal insufficiency if extrarenal causes can be excluded, but the absence of oliguria, when a possible cause of acute renal failure is operative, does not exclude failure.

In contrast to chronic uraemia, there are few symptoms of acute renal failure, apart from those of the causal disease. Progressive drowsiness does occur and cardiac arrest may cause sudden death, but convulsions and tetany are uncommon. Diagnosis therefore depends more on a knowledge of the causes of acute renal failure than on any characteristic clinical picture, apart from anuria. If the diagnosis is suspected on clinical grounds it can be confirmed or disproved by determining either the blood urea or the non-protein nitrogen, whichever estimation is the more convenient.

The treatment of the uraemia of acute renal failure is very important, since the renal damage is often transient and reversible. Tradition associates acute renal failure with a high death rate—50% or more—but recent work indicates that untreated suppression of urine carries a good prognosis, and that many of the recorded deaths have stemmed from injudicious efforts to force a diuresis by a high intake of fluid and electrolytes. When the kidneys fail, the body loses its main defence against overloading with salt and water, and pulmonary oedema or water intoxication may cause death even when nitrogen retention is quite moderate.

The main object of treatment is to prevent overloading with fluid, and to this end the fluid intake should be restricted to a litre or less a day, and salt should not be given. It is also desirable to diminish nitrogen breakdown and so retard the increase in the blood-urea level, even though there is no direct evidence that retained urea is harmful. Protein breakdown is at a minimum on a diet which is protein-free but adequate in calories. Bull and his colleagues (1949) have devised a practicable regime which seems to meet the indications in anuric uraemia. A plastic stomach tube is passed, and in each 24 hours the following mixture is dripped in steadily:

Glucose	400 g.
Peanut oil	100 g.
Acacia	q.s. to emulsify
Water	to 1 litre

No salt is given, but any vomit is collected, filtered through lint, and dripped back into the stomach, so that no actual loss of electrolytes occurs by vomiting. This regime is continued until diuresis starts. A good deal of fluid and salt are then lost in the urine, and the intake of water and salt must be correspondingly increased.

I believe that this regime, or some close analogue of it, will become the accepted treatment in anuria, and that

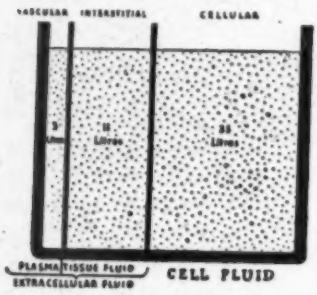


FIG. 1.—Body fluid compartments (man of 70 kg.).

in the ordinary case it will obviate any of the ingenious methods which have been devised to perform artificially the excretory part of renal function. These methods have the disadvantage of needing detailed supervision, and carry a constant risk of water and salt imbalance. In special cases in which the rate of nitrogen formation in the body is increased (as by infection or trauma) it may be necessary to lower the blood-urea level. Also, when oedema is already present as a result of overloading with fluid, there may be an indication for controlled dehydration. For these purposes intestinal intubation with a Miller–Abbott tube and perfusion with hypertonic solutions have been used by various workers. Black and Stanbury (1948) used sodium sulphate, but some sodium is probably absorbed, and Brun (1949—personal communication), of Copenhagen, has successfully used 5% lactose for intestinal perfusion. For most cases of urinary suppression, however, there seems no point in going beyond the practical and successful regime advocated by Bull *et al.* (1949).

Chronic Renal Failure

This may arise in the terminal phase of nephritis, in chronic pyelo-nephritis, polycystic kidney, the urinary obstruction of prostatic enlargement or congenital malformation, and in diabetic or hypertensive nephrosclerosis. These are a few of the common causes. As expected of a chronic state, the symptoms are more prominent and varied than in the uraemia of acute renal failure; the presenting symptoms may have little apparent connexion with the kidneys, to which fact uraemia owes its reputation for evading diagnosis. It encroaches on the terrain of almost every medical specialty, and therefore is a valuable reminder that a knowledge of general medicine can never safely be allowed to atrophy.

The main clinical features include wasting, pallor due to a refractory normocytic anaemia, respiratory distress and hyperpnoea, nausea, vomiting, and diarrhoea, general lethargy, and, in some cases, convulsions or tetany, disturbance of vision with retinopathy, and a liability to such complications as pericarditis or dehydration. Some of these symptoms are of course related to the hypertension which so commonly accompanies renal failure, and others are related to changes in water and electrolyte metabolism rather than to nitrogen retention. The suspicion of uraemia should prompt close inquiry into the past history for evidence of acute nephritis, recurrent urinary infection, or difficulty in passing urine. Increasing frequency of micturition, especially at night, is a valuable sign of progressive renal failure.

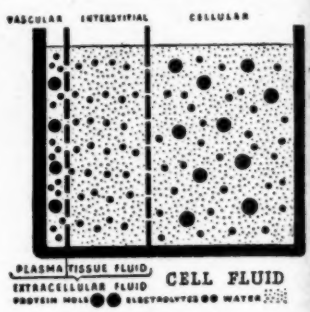


FIG. 3.—Showing the osmotic relationship between the body fluid compartments.

Examination of the urine may show albumin or a deposit of red cells or casts, but these signs may be masked by the polyuria of renal failure, especially when progressive fibrosis of glomeruli has lessened the amount of albumin and the number of red cells entering the urine. Addis has stressed the importance of broad "renal-failure" casts as signs of advanced kidney disease. Blood-urea estimation confirms the diagnosis of uraemia. Estimation of the serum calcium, sodium, and alkali reserve may be of some use in symptomatic treatment.

The treatment of chronic uraemia is essentially palliative, except when urinary obstruction can be relieved surgically. Rest and a low protein diet will prolong life, and the fluid intake should be adequate, at least 2 litres a day. A high urine volume assists the elimination of urea. In the presence of oedema a salt-poor diet may be indicated, but care is needed in this, as sodium reabsorption is impaired in a minority of patients with renal failure, and such patients easily become dehydrated if the dietary salt is restricted. A few patients may even need a high salt diet when large amounts of sodium chloride are lost in the urine. The distressed breathing of a conscious patient with acidosis can be relieved by M/6 lactate infusion. Calcium gluconate, 10 ml. intravenously, will relieve tetanic spasms. Attempts to rid the body of accumulated urea by purgation or other means are not justified in chronic uraemia.

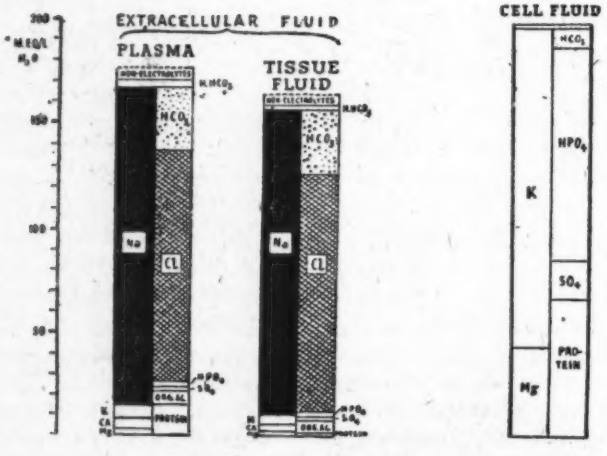


FIG. 2.—Composition of plasma and tissue fluid (extracellular) compared with that of intracellular fluid. The scale is graduated in milliequivalents per litre of water (= milligrammes per litre ÷ atomic weight × valency).

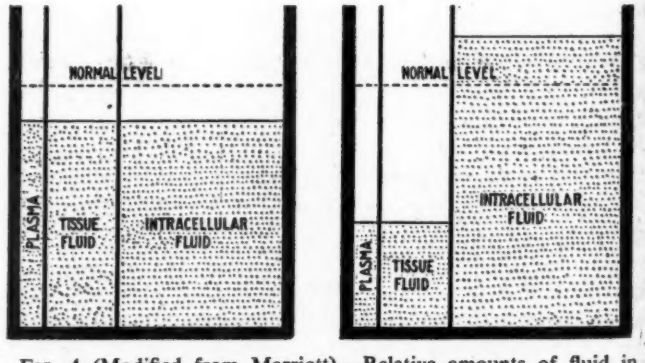


FIG. 4 (Modified from Marriott).—Relative amounts of fluid in the different compartments in pure water depletion and pure salt depletion. Note that in water depletion the fluid levels are low, but there is no loss of solutes from the body, so osmotic pressure is increased; also, the fluid losses are spread equally over the compartments. In salt depletion the loss of salt forces a contraction of extracellular fluid, and also a fall in osmotic pressure; there is no loss of solutes from the cells, so water passes into these to bring the osmotic pressure down to the level prevailing in extracellular fluid; the actual amount of fluid in the cells is thus increased.

"Extrarenal" Uraemia

This is a complication of severe loss of blood, vomiting, diarrhoea, traumatic shock, Addison's disease, diabetic coma, acidosis, alkalosis, and of other conditions in which there is gross diminution of plasma volume or change in the electrolyte composition of body fluids. Although increased breakdown of body protein probably plays some part in the production of this type of uraemia, the most important cause is a functional renal failure. Detailed studies have always shown a reduction in renal blood flow and in glomerular filtration rate. The symptoms and treatment of this form of uraemia are the same as those of the causal disease. It is of some importance as an indication that replacement of blood or fluid is not yet adequate.

Dehydration

It is unfortunate that this term has been used to denote two syndromes which are opposite in their cause, in their effects, and in the appropriate treatment—the syndromes of water deficiency and of salt deficiency. Advances in intravenous technique have made it possible to drown a patient or to pickle him in a very short space of time, and such events can be avoided if a few quite simple facts about body fluids are understood and applied.

The primary division of body fluids is into the fluid inside the cells and the fluid outside the cells (intracellular and extracellular fluid). The intracellular fluid contains negligible amounts of sodium chloride ("salt") but is rich in potassium and phosphate. The extracellular fluid contains sodium and chloride with some bicarbonate; it is further subdivided into plasma and tissue fluid. The relative amounts of these different fluids are as follows:

	% of Body Fluid	Salt	Protein
Intracellular fluid	40	−	++
Extracellular fluid — Tissue	20	+	−
Extracellular fluid — Plasma	5	+	+

Although the plasma is small in volume compared with the tissue fluid, it is important not only because it is accessible to analysis but also because it is the fraction of body fluid which perfuses the alimentary tract, the lungs, the kidneys, and the skin, which among them regulate the amount and composition of body fluid. Water passes rather freely between the fluid compartments, but salt is effectively limited to fluid outside the cells. Since water can pass freely between the compartments, the total ionic concentration of the various body fluids is identical, if we ignore the variations caused by their different protein content; any local increase in ionic concentration would cause an influx of water until equilibrium is restored.

Experimentally, relatively pure water deficiency and salt deficiency have been produced both in man and in animals. In water deficiency both compartments share in the fluid loss and there is an increase in the ionic concentration of the body fluids generally. In salt deficiency, by contrast, the extracellular fluid compartment is selectively depleted, for salt loss does not affect the intracellular electrolyte; the intracellular fluid is actually increased in salt deficiency, for the ionic concentration of body fluid is lowered by the salt loss, and water passes into the cells to dilute their electrolyte down to the general level.

This selective depletion of extracellular fluid is a very important aspect of salt deficiency, for it implies an early fall in plasma volume, with peripheral circulatory failure appearing early. For any given total loss of fluid, salt deficiency causes much graver circulatory impairment than does a corresponding water deficiency. If salt solution is given to a patient with water deficiency even more water is sucked out of the already depleted cells. If glucose solution is given to a patient with salt deficiency some of the fluid taken is excreted, and some goes into the already dilute intracellular fluid. These are both examples of ineffective and even harmful replacement therapy.

In clinical work pure patterns of water or salt depletion are uncommon, and it is usual to find a mixed depletion in which either water or salt loss is the dominant but not the sole lesion. The problem is further complicated by the fact that clinical fluid depletion is often attended by acidosis or alkalosis, and by impairment of kidney function. These complications may obscure diagnosis and add to the difficulty of treatment. For example, a patient with diarrhoea who is given only water to drink will become deficient in salt, but he will also develop acidosis, as the intestinal secretions are alkaline in reaction. Although the urine might be expected to be free from chloride owing to the salt deficiency, in point of fact it will contain significant amounts of chloride, because of the attempt by the kidneys to counteract the acidosis by excreting fixed acid. But if renal failure is also present the urine may be chloride-free, owing to a gross fall in glomerular filtration. This example shows the sort of difficulty which individual cases may present; in this particular instance the most trustworthy guide to treatment is a knowledge of the characters of the fluid which the patient has lost. Replacement demands a salt-containing solution, possibly with sodium lactate added.

General Principles

The detailed assessment of fluid therapy requires a good and rapid biochemical service, and cannot appropriately be discussed in an article of this type. A few general principles will be stated, the study of which may help to avoid the grosser mistakes in intravenous therapy even when no biochemical facilities are available.

1. As much information as possible should be obtained, by history and by direct observation, about the amount and character of any fluid lost from the body. In spite of the difficulties, vomitus and fluid faeces should be collected and measured; an assessment of fluid loss even in pints is better than the usual ignorance on this subject.

2. Alimentary-tract secretions have a total ionic concentration about the same as plasma. They must be replaced by saline solutions. To replace vomit, 0.45% saline is suitable, but an even better method when the patient is being fed by drip is to strain the vomit and return it in the drip (Bull *et al.*, 1949). A solution containing 6 g. of salt and 3 g. of sodium bicarbonate per litre is suitable for replacing fluid lost in watery stools; this can be given by duodenal tube. Patients with diarrhoea are thirsty, but if they are given only water and non-saline drinks salt deficiency will be caused.

3. When the main cause of fluid imbalance is a defective intake of fluid, water deficiency is likely to occur, because the fluid lost from the body by skin and lungs is hypotonic, and if the urine volume is reduced the kidneys cannot get rid of an amount of salt corresponding to the fluid lost by extrarenal channels. If fluids cannot be given by mouth 5% glucose should be given intravenously. A suitable amount for a patient without fever in a temperate climate is one litre a day; with fever or thermal sweating, this amount should be increased.

4. In the absence of renal disease, oliguria is a sign of fluid depletion. A urine volume of less than one litre a day in a patient with no vomiting or diarrhoea means that the fluid intake is inadequate, and the intake of watery fluid by mouth should be increased to two litres or more.

5. A good rough test for salt deficiency is the Fantus drop test for urinary chloride, carried out as follows:

One drop of 20% potassium chromate is added to ten drops of urine. The pipette is washed in distilled water, and used to add 2.9% silver nitrate to the urine until the yellow colour changes sharply to brownish red. The number of drops used indicates the number of grammes of salt per litre of urine. The colour change may occur with the first drop of silver nitrate added, showing a salt content of less than 1 g. per litre.

This test is significant only when the urine specimen is reasonably concentrated, and when there is no disease of the suprarenal glands. Moreover, it may fail to show salt deficiency in the presence of acidosis. With these reservations a salt concentration of less than 5 g. per litre indicates the need for increasing the saline intake.

6. Whenever possible, fluid should be given by mouth, and parenteral therapy reserved for those patients whose vomiting or diarrhoea makes the alimentary route impracticable. If a duodenal tube can be passed and retained, it may enable the alimentary tract to be used in a patient with vomiting. Large amounts of fluid can be given safely in this way, and it is an old observation that fluid given by the bowel is better retained than parenteral fluid. Moreover, intravenous fluid carries some risk of circulatory overloading and pulmonary oedema.

In concentrating on the essentials of fluid therapy I have had to omit such important topics as the effect of alkalosis and acidosis, the dangers of potassium depletion by copious saline infusion, the special problems of infancy, and even the general clinical signs of fluid depletion. The excuse for this last omission must be that the diagnosis of fluid depletion is less difficult than a decision about appropriate treatment. The other omissions seem to me to concern matters which cannot well be dealt with apart from accurate laboratory investigation and hospital treatment. Marriott (1947) gives a fuller review of the problems of dehydration in his Croonian Lectures, which were published in the *Journal*.

Diagrams reproduced by kind permission of Professor Gamble and Dr. H. L. Marriott.

REFERENCES

Black, D. A. K., and Stanbury, S. W. (1948). *British Medical Journal*, 2, 1101.
Bull, G. M., Joekes, A. M., Lowe, K. G., and Evans, B. (1949). *Lancet*, 2, 229.
Marriott, H. L. (1947). *British Medical Journal*, 1, 245, 285, 328.

A joint committee has been established in Glasgow to consider the best methods of combating tuberculosis in that city. Representatives have been appointed by the Scottish Western Regional Hospital Board, the Glasgow Executive Council, and the Glasgow Corporation. After the first meeting of this committee it was stated that there were two immediate problems: one concerned the shortage of beds and was the responsibility of the Hospital Board, and the other was the danger of infectious patients in the home, this being the responsibility of the local authorities. It was reported to the committee that notifications of pulmonary tuberculosis in the city increased by 62% between 1938 and 1949. The total number of beds available for tuberculous patients is now 1,300, and it is hoped that an additional 132 beds will shortly become available. At the end of December, 1949, 1,403 patients were awaiting admission to sanatoria: this figure compares with 1,423 in July, 1948, and 1,700 in the middle of 1949.

THE ROTHWELL STERILE-WATER SYSTEM AND ITS UROLOGICAL APPLICATION

BY

A. M. McMASTER, F.R.C.S.Ed.

Surgeon and Urologist, Rochdale Infirmary; Urologist, Birch Hill Hospital, Rochdale

To prevent furring of the water-sterilizing plants waste condensate water from the steam-heating systems has from time to time been used in hospitals in areas where the water was exceptionally hard, but so far as I can ascertain it is only during the past few years that use has been made of the fact that this sterile distilled water was ready for use in the operating theatre.

Some years ago the original experimental plant was designed by the hospital engineer, Mr. E. Rothwell, and installed at Birch Hill Hospital, Rochdale. It is no exaggeration to say that it has continued to function without interruption or difficulty until the present day. As is the case with many brilliant inventions, the basic idea was extremely simple once the principle had been grasped. The system is founded on the fact that in all steam-heating systems cooling of the pipes causes part of the steam to be condensed as sterile distilled water, and in the normal plant this condensate is collected in steam traps and is piped back to the boilers to save fuel. Such condensate is absolutely sterile, as it is usually produced from steam delivered from the high-pressure boilers in the region of 70–80 lb. per square inch (4.92–5.62 kg. per cm^2.).

The Rothwell system makes use of this condensate by collecting it in a suitable tank in a basement and pumping the water by a simple steam-operated float pump, which requires no attention, to tanks over the operating theatre (Fig. 1). The hot condensate can then be carried by gravity direct to the theatre, where hot sterile water is available from a wall tap for all purposes, thus eliminating all water boilers and sterilizers from the theatre. A part of the hot

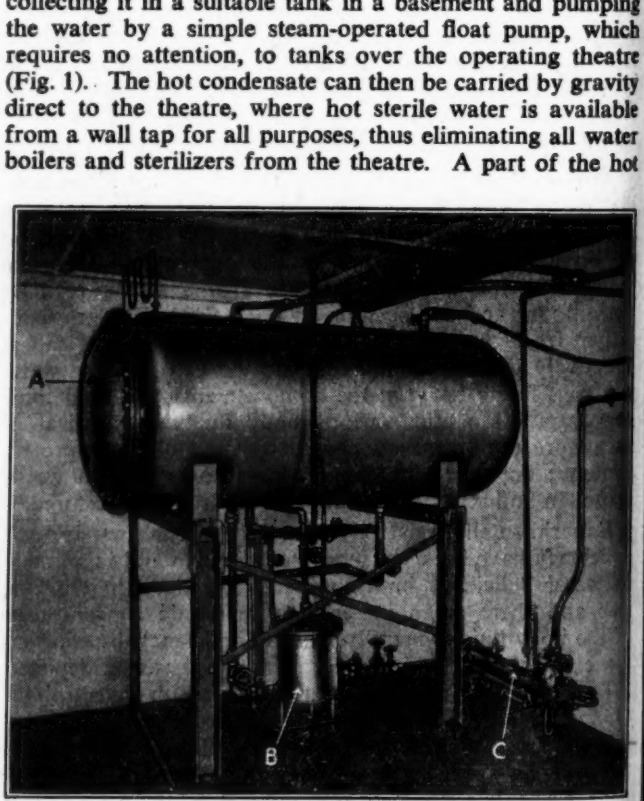


FIG. 1.—Main storage tank for sterile water, installed in the basement. Its contents are automatically pumped to auxiliary tanks above the operating theatres. A = Main storage tank. B = Automatic steam float pump. C = Condensate temperature controller (calorifier).

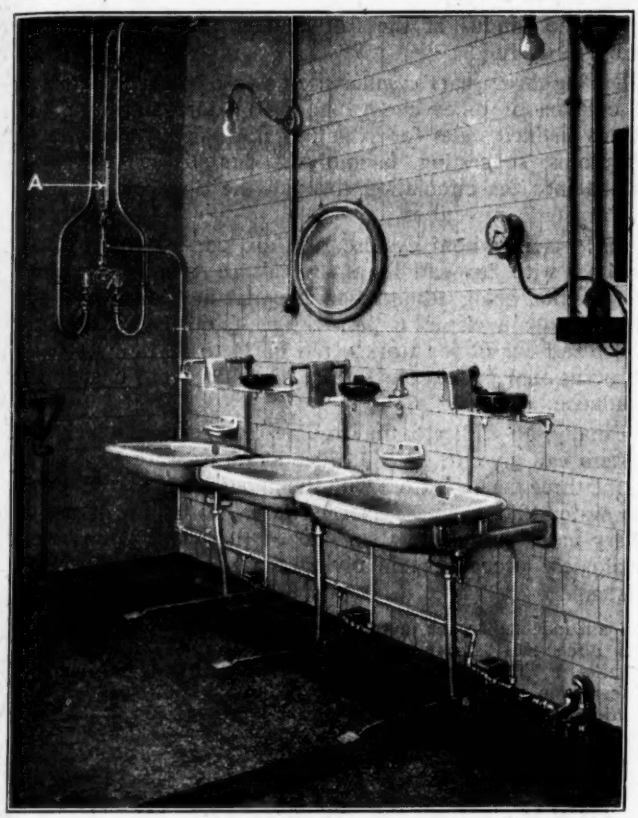


FIG. 2.—Scrub-up sinks with faucets operated by a foot-pedal and mixing-valve with continuous-flow pipe and thermometer near by. A = Thermometer on delivery pipe to douche and scrub-up systems. Mixing valve is below thermometer.

water is transferred to a second roof tank containing a large sealed cooling coil from the ordinary water mains, and this cold water is fed, again by gravity, to a cold-water tap for delivery of cold sterile water.

As soon as the main storage tank in the basement begins to fill with sterile distilled water from the condensate mains the apparatus functions automatically, as the steam-operated float pump operates every 15 seconds and transfers a continuous supply of sterile water to the subsidiary tanks over the operating theatre. When these become full the excess water overflows by a closed pipe back to the main storage tank in the basement. Consequently, the sterile water in the whole system is always circulating and never becomes stagnant—in fact, fresh sterile distilled water is added continuously from the steam mains, any excess in the main storage tank being carried away through a water-sealed overflow to the main condensate line to the boiler-house, thus avoiding any waste of valuable condensate.

When the system is first installed it is closed and "live" steam is passed through it for three hours to sterilize it; then it is completely sealed so that it is impossible for any infection to enter and contaminate the water. It has been the practice in Rochdale to have the water bacteriologically tested once a month, and it has always been free of any organic matter and bacteria. The older methods of preparing sterile water in the operating theatre or a sterilizing-room suffered from many disadvantages, the greatest undoubtedly being the human element, for if the supply of sterile water should run out during the operating session the urgency of the need for it might lead to water being supplied which had not been boiled long enough to ensure complete sterility. Most surgeons will know of occasions when the sterile water supply was under grave suspicion when clean operation cases have become infected.

After several years' experience of the experimental plant at Birch Hill Hospital the system was installed in the Rochdale Infirmary in October, 1946, and hot and cold sterile water-taps were installed in two theatres. The experience of the original installation was so satisfactory that, in addition, the ordinary taps were removed from the scrub-up basins and sterile water was brought there. For this purpose the hot and cold sterile water is supplied direct to a thermostatic mixing-valve with a thermometer attached. This valve is alongside the wash-basins, and with its aid the temperature of the water can be instantly adjusted so that water may be delivered at a constant temperature. Each delivery pipe to the basins is controlled by a pedal or stud in the floor which is conveniently situated so that it can be opened by the foot while scrubbing up, without standing in a strained position (Fig. 2).

Once installed the apparatus requires no care or maintenance, and inquiry shows that there has been no detectable increase in fuel costs for steam production at either hospital since the system was installed, as the quantity of condensate used forms such a small proportion of the total production. Originally the amount of tap-water used by the cooling coils was extravagant, as it was allowed to run continuously throughout the 24 hours, but this has been overcome by installing taps so that the coils may be shut off when the theatres are not in use. In spite of this the cold sterile water supply is always ready for use within a few minutes of the cooling supply being restarted.

Urological Application

Having always been dissatisfied with the douche-can method of water supply for urological purposes, with its risk of infection from the transfer of water from the sterile supply to a jug and thence to the douche-can, in which the surface of the water is exposed to the air during the transfer and filling, I requested the makers to adapt the sterile water supply so that it could be delivered over the operating tables at the place where it was needed for irrigations or douches.

The first problem to be solved was that of the temperature at which the water was delivered, because all water delivered from a gravity tank to taps or scrub-up basins takes a few moments to heat up the piping and be delivered at the correct temperature. If the flow is not constant, as in urological work, the same thing occurs each time the supply is used, which is obviously unsatisfactory in urology, as cold water would be delivered into the bladder. In consequence a continuous-flow pipe was attached to the same mixing-valve, which is set at the appropriate temperature (98–100° F.—36.7–37.8° C.), and the water is carried thence across the ceiling of the theatre and back to overflow into the main storage tank in the basement for return to the boiler-house. From this supply a double delivery pipe on a flexible mounting is brought down immediately over the operating table to a height of 6 ft. 6in. (2 m.). This device has an inner outflow-tube which delivers its contents to the main overflow pipe and which extends almost to the bottom of the main outer tube. Consequently, as the water flows in at the top, it is always circulating, even when not in use, and is delivered to the outlet nozzle at the correct temperature without any time lag (Fig. 3).

At the lower end of this flexible mounting there is a needle valve and a bayonet catch for attaching the connexion for the water supply to the instrument in use. The needle valve can be set to very fine limits so that water is delivered at any speed from a few drops a minute up to a stream much more powerful than it is safe to use in the bladder or any other form of irrigation. In practice this has proved so successful that it is now my usual procedure

FIG. 3.—Irrigation supply pipe, with needle-valve control connected to a cystoscope.

to use a flushing cystoscope for the simplest examinations, as it is easier to attach the sterilized tubing to the delivery pipe and cystoscope than to fill the bladder by syringe or any other means; while in cases of cystitis, tuberculosis, or blood clot in the bladder the medium is cleared more rapidly and efficiently than by any other method. Exactly the same benefits are achieved with the urethroscope and the "cold punch," and one has the satisfaction of knowing that only sterile distilled water at the correct regulated temperature is passing into the bladder. In transurethral prostatectomies by the "cold punch," in addition to these advantages, the adjustment in the water flow which is necessary when the removal of prostate is completed and haemostasis is started can be achieved instantly by altering the needle valve. In practice this has rarely been necessary, as the required alterations can be made with the tap on the instrument.

A Marion tap is also included in the delivery tubing in case it is necessary to stop the water supply completely at any time, such as when changing instruments, thus avoiding adjustments of the needle valve during an operation.

Even with a relatively slow supply of water the head of pressure, which is at least 12 ft. (3.66 m.) with a single-story building, will eventually build up in the bladder unless certain precautions are taken. All cystoscopic and transurethral procedures are given only a low-saddle analgesia by means of 1 ml. of heavy cinchocaine hydrochloride ("nupercaine") in a sitting position. This gives analgesia of the base of the bladder and the whole urethra but leaves the fundus of the bladder sensitive, so that if it is overdistended in any way the patient begins to show distress by moving even before he complains that the bladder is full.

This precaution has been found effective even in the small 2–3 oz. (57–85 ml.) capacity bladders which occur in tuberculosis or chronic interstitial cystitis, but the additional precaution is taken in each case of having a nurse or other assistant keeping a hand above the pubis to give the operator warning as soon as the bladder has risen enough to be palpable. This is probably not essential in the ordinary cystoscopy, but during transurethral prostatectomy, where the neck of the bladder may have become rather thin after removal of the median lobe, there is a risk of rupture of the bladder neck by the extra tension caused when the discomfort of a full bladder makes the patient move. In all cases it has been found wise to have the assistant's hand on the abdomen, and our experience shows that a junior probationer can be rapidly trained to detect the fundus of the full bladder before it becomes dangerously full.

During three years' regular use no case has been detected of oedema or other change in the bladder from the use of this distilled water for irrigation, nor has any case shown symptoms suggesting haemolysis due to water being forced into the circulation through the open cut veins in the prostatic resections.

Patients in whom cystoscopies are carried out by this method with low-saddle analgesia are treated as semi-outpatients, being admitted to hospital at 9 a.m. and discharged again about 6 p.m. The majority suffer little effect and are fit for work again in 24 to 48 hours. Only an occasional patient shows any disability from post-spinal headache.

Finally, to indicate the trouble-free service which the system can give, in 1948 3,870 operations were performed in the three theatres fitted with the apparatus. Sterile scrub-up water and ordinary sterile water would be in use in every case, and more than 400 of these operations were urological procedures involving the use of the irrigating system.

I am indebted to the inventor, Mr. E. Rothwell, late engineer of the Birch Hill Hospital, Rochdale, and to the makers, Messrs. Charles F. Thackray, Ltd., Park Street, Leeds, 1, for technical information and diagrams and for the care with which they have carried out my wishes in installing the apparatus.

APPLICATION OF SCIENTIFIC METHODS IN INDUSTRY

MEDICAL RESEARCH COUNCIL THREE-DAY CONFERENCE

A conference on the application of scientific methods to industrial and other problems was held, under the auspices of the Medical Research Council, at the London School of Hygiene and Tropical Medicine on the three last days of March. The principal subjects of discussion were the technique of field surveys, health hazards in certain industries, and the improvement of human performance by attention to the working environment, better design of industrial furniture and tools, and the application of psychological studies to the worker and his job.

Field Surveys

The first day of the conference, which was opened by Dr. H. P. HIMSWORTH, secretary of the Medical Research Council, was devoted to scientific methods in field surveys. Professor A. BRADFORD HILL discussed the sampling method. If a whole population was taken for survey there would, of course, be no sampling problem, but he would prefer to have a sample of one in four of a population to taking the whole population when the answers of one in four were missing. Care must be taken in sampling to be sure that all had an equal chance of appearing in the sample, which would not be the case if, for instance, the selection was based upon the initials of surnames. He defined the steps to be taken to eliminate the bias of personal judgment which was bound to turn up when dealing with group problems, and, to quote Dr. Himsworth afterwards, "like all statisticians, he assigned to statistics a relatively subsidiary role."

Dr. D. D. REID, reader in epidemiology at the University of London, described a system used in the investigation of absence due to sickness among workers in the London G.P.O. It was a flexible system under which standardized morbidity rates were worked out for each age group, according to sex and grade of employment.

Dr. R. DOLL, of the M.R.C. Statistical Research Unit, described an investigation into occupational factors in peptic ulcer. He spoke of the need in such inquiries for full co-operation with the workpeople, who were sometimes inclined

to suspect that these surveys were for the benefit of the management. Between 5,000 and 10,000 people were investigated. The use of volunteers was regarded as unsatisfactory, and trained social workers were employed to interview the people, with instructions to report to doctors any cases of dyspepsia. A random 10% sample of those whom the social workers had graded as normal was also further investigated. It was sometimes found that what were apparently two different facts were two different personal impressions of the same fact.

Professor J. H. SQUIRE, director of the M.R.C. Industrial Medicine Research Unit, emphasized the need for clarity in the questions set and the importance of making known to all the investigators employed the reason for the inquiry. The individual who carried out a field survey should always have been trained in the laboratory; such training gave him a smattering of statistical knowledge and made him a better observer.

Dr. ALICE STEWART, acting director of the Institute of Social Medicine at Oxford, discussed occupational and domiciliary factors in pulmonary tuberculosis. The boot and shoe trade was exceptional in having a high tuberculosis death rate. Operatives in the printing trade were formerly much subject to tuberculosis, but there had been an improvement in incidence during this century. In the fishing industry, with the coming of steam and other types of power for trawlers, there had been an increase in the tuberculosis death rate among fishermen, and the figure was still rising, in contrast with the remarkable freedom from tuberculosis which fishermen, although coming from a low economic level, enjoyed in the nineteenth century.

Health Hazards in Metal Industries

Fluorosis and beryllosis as industrial and community health hazards were reviewed by Dr. DONALD HUNTER, director of the department for industrial research at the London Hospital. Compounds of fluorine were increasingly important in industry. Hydrofluoric acid was used in clouding electric light bulbs, etching glass, and pickling metals and wire. The fluorides entered into the composition of artificial fertilizers, insecticides, and fumigants which were employed in agriculture. Owing to their corrosive properties these substances must be handled with every precaution. The worst danger arose from the volatility and extremely corrosive nature of the vapour of anhydrous hydrofluoric acid. Both hydrofluoric acid and fluorine if inhaled attacked the larynx and trachea. The ultimate result was slow ulceration of the gums, nasal mucosa, larynx, bronchi, and conjunctivae. Locally applied exhaust ventilation should be used to remove gases as near to their point of origin as possible, and mechanical methods substituted for hand labour.

Dr. Hunter went on to say that a considerable hazard existed in preparing and mixing the powders which coated the tubes of fluorescent strip lamps and certain tubes used for electric signs. The compounds involved were zinc beryllium manganese silicate, zinc beryllium silicate, and beryllium oxide. There were many reports on dermatitis and acute respiratory illness occurring among workers handling beryllium compounds. Dermatitis might be severe, and sensitization, once established, was permanent. Pulmonary lesions were much more severe and disabling. Workers at risk should be seen at regular intervals by a doctor and questioned about suggestive symptoms. Repeated medical and *x*-ray examinations should be made of all workers with unexplained symptoms, particularly respiratory symptoms. The existence of the hazard of non-occupational beryllium poisoning in the neighbourhood of factories handling this substance presented a challenge not only to the guardians of health in industry but to public health authorities in industrial communities generally.

The use of experimental pathological techniques for the assessment of the toxicity of chemical compounds was the subject of a paper by Dr. JOHN BARNES, director of the M.R.C. Toxicology Research Unit. The behaviour of animals fed on, injected with, or exposed to the compounds was carefully watched, and the tissues of animals killed or dying during the experiment were examined histologically. A few simple biochemical tests were done to find out which system was affected. It was important never to ignore the bizarre or unexpected, although all interesting and surprising results were checked by repeating the experiment—frequently a humbling and depressing experience. The significance of any deviation from the normal must be established by the usual statistical methods.

"We are not afraid to 'stick our neck out' and make what we hope are intelligent guesses. We try to avoid wasting time chasing obsessions, but we are not afraid to do 'bassoon' experiments (so named in memory of Charles Darwin's attempts to influence the growth of sweet peas by playing to them on that instrument)."

Dr. Barnes referred to some work being done at present on the use of "B.A.L." (dimercaprol) in nickel poisoning. Experimentally it was found that rats poisoned by nickel carbonyl were made worse and not better by B.A.L.; rats poisoned by nickel sulphate by injection were not benefited by B.A.L., while rabbits poisoned by nickel sulphate were saved by B.A.L. They were going to repeat the experiments with nickel carbonyl on rabbits. Thus it was not known yet whether B.A.L. would make a poisoned man better or worse. Actually in the past B.A.L. had been used first on man in cases of metal poisoning, and the point of his remarks was not directed at all against the value of this substance. It only emphasized the difficulties of interpreting purely laboratory experience in terms of clinical practice.

Health Hazards in Dusty Industries

A paper on problems in the investigation of coal-workers' pneumoconiosis by Dr. C. M. FLETCHER, director of the Pneumoconiosis Research Unit at Cardiff, was read in his absence, and Dr. A. COCHRANE and Dr. J. C. GILSON, of the same unit, spoke on other aspects of this subject. In pneumoconiosis there were no pathognomonic features except the coughing up of a large amount of black sputum, which occurred only at a very late stage. The other symptoms, such as pain in the chest and shortness of breath, were in no sense specific. What was wanted was some measure of the dust to which the men were exposed over long periods, but no instrument for this purpose was available at present.

Dr. Cochrane said that dust measurements in mines had been made only quite recently, and usually at the coal-face and during the coal-getting shift. If all the men in one pit were examined by *x* rays a considerable number would always be found who would have been certified had they gone to the pneumoconiosis panels. There was a great deal of latent disease varying from pit to pit according to the extent to which miners in the pit were "pneumoconiosis-conscious." He described the method adopted of selecting for examination people who had worked only at the coal-face over a given period and had not been exposed to any other risk likely to produce radiological changes. The index so obtained was called the "attack rate." It was found that there was no simple relationship between the attack rate of the disease and the amount of dust of respirable size to which they were exposed. Incidentally he criticized the mass radiography of miners, which illustrated, he said, nearly all the faults of survey work. To begin with, a very unsatisfactory size of film was used—35 mm.—and it was read usually only on one occasion, and only a small proportion of the population concerned was examined.

In a general discussion it was suggested that there was no doubt that pathogenicity increased as the particle size of the dust decreased. Large amounts of coal dust might mask the effect of small amounts of quartz, the latter remaining in the lung and producing pathological effects. Dr. Cochrane said that the general view on the effect of coal in pulmonary tuberculosis was that it increased the attack rate but diminished the case-mortality rate. The theory of the late Lyle Cummins that coal dust protected miners against tuberculosis was recalled.

Environmental Factors and Human Performance

A session was devoted to the effects of warmth on comfort and efficiency. Dr. T. BEDFORD, director of the Environmental Hygiene Research Unit, said that thermal environment was a complex matter. Each of four factors must be taken into consideration in any assessment: temperature, humidity, speed

of movement of the air, and radiation from surroundings. The conditions under which the average person declared himself "comfortable" varied considerably. In a number of people tested, normally clothed and doing light work, 70% declared themselves entirely comfortable at temperatures from 60° to 68° F. (15.6°–20.0° C.). At temperatures ranging from 54° to 72° F. (12.2°–22.4° C.) there were never more than 60% of people who were not entirely comfortable. There was great variation in sensitivity to draughts. Some complaints of draughts were made when the air speed was as low as 20 ft. a minute. It had often been stated that one of the things that made for comfort in a room was that the walls should be warmer than the air. Tests made in his unit suggested that this was true. If temperature conditions were bad and then were improved, the workers who felt the most benefit were commonly the least able people; the more expert seemed to make a good showing even under bad conditions.

Dr. J. S. WEINER, of the Climatic and Working Efficiency Research Unit, described some physiological studies of the effects of heat based on estimations of sweating. When men lost a lot of salt in sweat they underwent an adaptation which brought about a balance between their intake and output at a lower level; this balance could be achieved apparently at an extremely low salt intake. Contrary to the American view, they had not seen in their work at Oxford any association between heat exhaustion and a low vitamin C content of the blood.

Discussion then turned on the value of breaks in working hours. A 10-minute break was usually followed by increased output, but when individual responses were examined, said Dr. Bedford, the workers who had the lowest aggregate output showed the biggest response to the rest pause, whereas the more efficient showed a slight loss of production on starting again after the break.

Dr. H. DAROUS, of the Climatic and Working Efficiency Research Unit, discussed anatomical factors in machine design. He said that it was not at all difficult to walk into any factory and find examples of bad design. One speaker suggested that machines built originally for men had been turned over to women, when women entered industry, without much, or any, thought about the desirable anatomical and muscular adaptations. Professor C. LOVATT EVANS said that he had found that the optimum height of the work-bench was 3 ft. ½ in. (92.75 cm.), and the half-inch made a great difference, but, of course, much depended on the stature of the worker.

Analysis of Human Activities

The lecture which Sir FREDERIC BARTLETT, director of the Applied Psychology Research Unit, Cambridge, gave on the last day of the conference, on the laboratory analysis of human activities, cannot easily be compressed into a short space. One point he made was concerned with the investigation of fatigue. Ten or fifteen years ago, he said, the investigation of fatigue involved the operation of a certain restricted set of muscles, the performance being repeated over and over again, and the results were expressed in the length of time during which the single operation had been repeated and the number of repetitions within that time. But it was very difficult by such a method to obtain an assessment of the overall performance. No true measure of fatigue processes or ageing processes or other data which were interesting to the industrial medical psychologist could be obtained unless the problem of overall efficiency in carrying out the total task was tackled. There must be a continuous record of all the steps in the performance of that task. The design of working conditions so as to eliminate unnecessary strain and undue fatigue was one of the most important problems to be considered from the point of view of public health.

A questioner referred to some American work which appeared to show that in a factory the lazier men were the more intelligent. Or was it that the more energetic men were not using their intelligence? Sir Frederic Bartlett said that the problem of intelligence in relation to industrial operations must be considered not only in regard to the particular job but to the life the worker lived outside his job. Many of the difficulties which modern industry ran into, owing to lack of correlation between the level of intelligence and the complexity or simplicity of an operation, were due to the fact that the problem of what people were to do when they got away from their job had not been taken seriously. Most industrial jobs would tend more and more to be jobs which would not satisfy the expanding level of general intelligence. This was a great occupational health problem.

In closing the conference Dr. HIMSWORTH said that the proceedings had illustrated the fact that applied science was necessarily a combination of fundamental laboratory work and field work. The one interacted on the other, and applied science could not exist without both. A problem must first be recognized in the field and defined there. Then it was dealt with in the laboratory, and when the laboratory had provided an answer it had to be taken out into the field again. The role of the field worker was first to recognize and define the problem, and then to translate the laboratory solution into the language of the executives. Often the difficulty was to demonstrate to the "hard-headed men" that what had been done was of practical value, and this could be demonstrated only in terms of results.

ROYAL COLLEGE OF PHYSICIANS

NEW PRESIDENT

Dr. W. Russell Brain was elected President of the Royal College of Physicians on Monday, April 3, at the age of 54. He is married and has two sons and one daughter. His wife, Stella, was the daughter of Dr. R. L. Langdon-Down, who was

[Burrell & Photo Press, Ltd.

for many years a member of the Council of the B.M.A. and was made a Vice-President.

Dr. Brain was educated at Mill Hill School and New College, Oxford, where he was a Theodore Williams Scholar in physiology, and at the London Hospital. He is now physician to the London Hospital and to the Maida Vale Hospital for Nervous Diseases. Dr. Russell Brain's most recent publication, and one which attracted much attention, was his paper entitled "Authors and Psychopaths" which appeared in the *Journal* of December 24, 1949.

Correspondence

Treatment of Menstrual Disorders

SIR,—Dr. G. I. M. Swyer's valuable paper (March 18, p. 626) should be read with care by every general practitioner and with still greater care by those gynaecologists (whose number, it is pleasant to observe, grows rapidly smaller) who still believe in a light-hearted hysterectomy for the relief of menstrual disorders easily treated by medical means.

The method described by Dr. Swyer of regulating irregular menstrual cycles, based, as he explains, on that of Hamblen, is essentially a modification of the much older method of Kauffmann. The method which I have used in some hundreds of cases over a period of fifteen years has a similar origin and differs from it in detail only; and I can confirm the good effects on the menses claimed by Dr. Swyer. I am less happy about his claim that this regime "results in ovulation in a useful proportion of cases." Though pregnancy has occurred occasionally, I do not remember that in any one of my patients it could be unhesitatingly ascribed to this treatment, bearing in mind, as one must, the number of "infertile" patients who ultimately conceive under various treatments or none at all. Dr. Swyer's 11% of pregnancies within nine months is impressive, but his series is small. If these pregnancies are indeed due to his treatment it may be that the apparently slight difference between his method and mine is important. This difference consists only in the fact that I give stilboestrol only up to the fifteenth day of the cycle instead of the twentieth.

There are, however, other reasons for casting doubts upon his claim to produce ovulation. Some three years ago the team working in the Philip Hill Parenthood Clinic at the Royal Northern Hospital (Mr. C. Lane-Roberts, Dr. S. Field-Richards, Miss J. Vaughan-Morgan, and myself) determined to test the validity of various claims to produce ovulation by various methods, including the use of gonadotrophic substances, sex hormones, and *x*-ray therapy (the last with the assistance of Mr. Anthony Green). We were aware of the large number of women who ovulate only occasionally, a fact not mentioned by Dr. Swyer, though I have no doubt he is well aware of it and has carefully considered it. We came to the conclusion that we would class as failures in ovulation suitable for our experiments only those women who, judged by their basal-temperature charts, failed to ovulate for three successive months. Each such woman was subjected to at least two endometrial biopsies as a check on the validity of the assumption that a failure to produce a diphasic curve implied a failure to ovulate. At first the measurement of the excretion of pregnanediol was used as a further check, a practice which was abandoned when it was realized that the procedure was not only laborious but unreliable.

We were in some doubts whether a period of observation of three months was long enough, doubts which have been confirmed by an occasional patient who, having deserted us for a time, returned with a long series of charts showing ovulation at still less frequent intervals. We were also not convinced of the complete reliability of basal-temperature charts as a criterion of ovulation, not only because of human fallibility but because we did not feel that their reliability had been sufficiently proven. Our experience has confirmed our suspicions, for three instances have occurred in which the results of the temperature readings and of endometrial biopsy have not been consistent. Nevertheless we proceeded with a "pilot" investigation.

The experiment was begun 18 months ago, but it has not progressed far. The reason is one which is very relevant to Dr. Swyer's paper. It is exceedingly difficult to find a sufficient number of women who fail to ovulate for three months in succession. Our plan involves the consideration of a group of women who are, in our belief, not ovulating and the division of this group into two—one for treatment and one for control. How many women will eventually have to be included in each group will of course be determined by statistical considerations. We believe that it will be large and we are prepared therefore for a long-term experiment. Out of 1,050 women investigated in the Philip Hill Clinic in the last 1½ years only 14 have so far satisfied our not overstrict criteria.

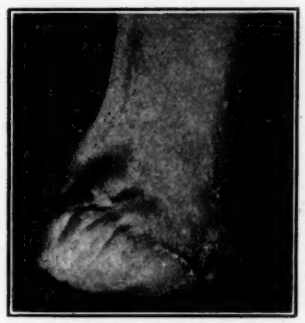
It appears that the qualification for inclusion in Dr. Swyer's group was one anovulatory endometrial biopsy. Is it not likely that his group consisted at least in part of occasional ovulators? Two of them were certainly of these. He describes his patients as "presumably or definitely anovular" before treatment and adds that in 14 instances "definite evidence of non-occurrence of ovulation was obtainable" and that in a further 17 "it was presumptive." But for how long did the "definite" failure to ovulate persist, and on what grounds were his presumptions based?

Dr. Swyer is very properly tentative in his conclusions. All must agree with him that his results are "encouraging," and that "the treatment *appeared* to be responsible for the re-establishment of ovulation in at least 15 out of 30 patients . . . in whom failure of ovulation had been *presumed* or proved." (The italics are mine.) It may well be that the appearances are not deceptive and that the presumption is justified. But those of us who have seen the rise and fall of other methods of inducing ovulation may perhaps be forgiven for demanding that that statistically difficult woman, the occasional ovulator, should be kept cautiously in mind.—I am, etc.,

London, W.1. RAYMOND GREENE.

Amputation at the Ankle

SIR,—Syme,[1] writing on his amputation at the ankle, "recommends it with all the earnestness in my power, notwithstanding the resistance of some obstacles." The present "obstacles" in this country come from limb fitters, who find a Syme stump difficult to fit with a good-looking prosthesis. Some surgeons maintain that the stump does not stand up to function over the years and that reamputation at a higher level is too frequently necessary. American and Canadian surgeons do not share either of these opinions.



Recently a robust lady of 73 under treatment for another injury walked into my out-patients in an "elephant" boot. On inquiry I learned that at the age of 3 her foot was amputated. Since then she has had no trouble with the stump. The length of the tibia was normal, she walked extremely well, and the muscle development of the leg was excellent.

I have examined many excellent functional end-results following Syme's amputation after ten, fifteen, and twenty years. But a seventy-years end-result says much for Syme's original contention that "the thick integuments of the heel" should be preserved if possible. The accompanying photograph shows the amputation stump.—I am, etc.,

Birmingham, 15. WILLIAM GISSANE.

REFERENCE

[1] *Observations in Clinical Surgery*, 1861. Edinburgh.

Gynaecology and Surgery

SIR,—May I be permitted to criticize one point in the letters of Mr. Douglas MacLeod (March 4, p. 548) and Mr. Oswald Lloyd (March 25, p. 730). I know they will forgive me. It is of their use of the word "pioneer" that I wish to say a word. A pioneer is surely one who lays the foundation of a project or structure, and their memory does not apparently carry them back far enough. I am second to none in my admiration of the magnificent work of my old friend Victor Bonney. I was his pupil, his first house-surgeon at the Middlesex, and had the honour subsequently of being his colleague and the great privilege of seeing his work and enjoying his friendship for 48 years, so I know what a very great contribution he has made to gynaecology.

But, Sir, the great structure which Bonney helped to build was built on this foundation laid a generation before by a man

named Bland-Sutton, of whom, though Middlesex men, the letter writers mentioned above do not seem to have heard. Have the younger generation forgotten that when Mr. Sutton, as he then was, first advocated subtotal hysterectomy for fibroids at a meeting of the old Medico-chirurgical Society he was called by a very eminent obstetric physician "a criminal mutilator of women," an expression which he never forgot or forgave to his dying day?

Have they forgotten that the opposition to his pioneer work, even at his own hospital, was so great that every specimen he removed from the pelvis had to be submitted to a committee of his older colleagues, and he told me that he worked then with the knowledge that one slip or disaster would have meant the call for his resignation? Do they know the old Chelsea Hospital for Women, from being in a very poor way, was raised by Bland-Sutton into being the Mecca for pelvic surgeons from all over the world—the theatre on his operating days being thronged with surgeons from every part of the globe? Do they remember that he was first to remove and describe in the old Middlesex hospital theatre a tubal mole? After completing his last hysterectomy, on his 75th birthday, in 1930, he told me that as a result of the persecution he experienced in his early days he had never done a hysterectomy without feeling that "virtue had gone out of him."

The gynaecologists of Mr. Bonney's day built on the foundations so truly and courageously laid by Bland-Sutton in the previous decade. It is perhaps tragic, and not a little humbling, that a man who did such "pioneer" work and who rose to such heights in his profession should be forgotten in so short a time by men trained at his own medical school and in the pathological laboratories which he founded and whose museum house so many of his specimens.—I am, etc.,

Painswick, Glos. RAYMOND E. APPERLY.

SIR,—While Mr. Oswald Lloyd (March 25, p. 730) may feel that at this juncture his letter is little short of a lament, it may interest him to know that I too share his feelings entirely. I have long held the opinion that the regulations governing the membership of the R.C.O.G. should be altered so that it must be taken in two parts. The first part should consist of a primary examination in the "basic sciences" and could well be the primary examination for the F.R.C.S. England or Edinburgh. Fusion between the several colleges at this level is surely still quite feasible and reasonable.

In so far as the final examination is concerned, I think the pattern laid down in the new regulations governing the F.R.C.S. Edinburgh, as applied to obstetrics and gynaecology, could serve as an excellent basis for discussion, and, if Mr. Lloyd is aware of its scope, I dare say he would be in substantial agreement.—I am, etc.,

Liverpool. H. VINCENT CORBETT.

The G.P. at the Crossroads

SIR,—The *Lancet* is to be congratulated on the prestige it undoubtedly enjoys with *The Times* and with other guides to public opinion, a prestige that is perhaps high enough to carry with it uncritical approval of this Gallup-poll research into general practice. Had I the good fortune to act as a temporary seeker for truth and health with this distinguished investigator, I should have been aware of my enormous advantage over him in knowing nearly all my patients beforehand and therefore in not having to confirm at each visit the position of the apex beat, the state of the teeth, the lower level of the liver, the palpable descending colon, the left varicocele, and so on.

As to a fresh case—say, an acute abdomen, which does not present every four or five days even in a large practice—a good doctor might well think that the less it was poked about the better. And as to the short and sometimes pithy conversation of thoughts and fears, of hopes and of confession, of home and social tribulations, a doctor of manners would hardly care to open matters of delicacy in front of a stranger, however great his prestige. For Dr. Joseph S. Collings was not there as a consultant or he would have made his own examination, doubtless according to his ideal standard of the absolute, though this supreme clinical service could be better applied in a well-equipped hospital and to a sifted problem of diagnosis and prognosis.

Unless a critique of relevancy be applied any inquiry may be drawn out to a sterile infinity, and had this been the discipline of Dr. Collings we might have been in his debt for a report of greater cogency and value. It would be of interest to read a few letters of comment from his short-term colleagues and subjects.—I am, etc.,

Salisbury. R. C. MONNINGTON.

SIR,—The endless stream of correspondence reveals the dissatisfaction of the majority of general practitioners with general practice as it is conducted to-day. But it must not be forgotten that the tendency towards these faults has been going on for years, long before the inception of the N.H.S. In my opinion there are two main causes for the degeneracy of the G.P.: (1) the growth of scientific medicine and the greater awareness of the public of this growth, which leads them to demand every sort of investigation and specialist opinion if even their minor symptoms have not subsided in ten days; (2) the rigid capitation fee, which forces us to grab as many patients as we can and to put up with endless nonsense and demands lest we offend someone and lose him, his family, and perhaps his friends.

Theoretically, no G.P. should grumble about certain of his patients. We can always ask them to go elsewhere. But I have yet to hear of any patient, however troublesome, who has failed to find a doctor. It is the capitation fee which has made the G.P. lose his self respect, pander to a patient instead of doing his best for the patient and trying to treat him, and it also accounts for the incorrect certificates that are given out every week in Great Britain and have been given out now for many years.

How can all this be altered? It is my submission that things could be improved if the following were instituted: (1) the formation of health centres, even modestly equipped, instead of our present travesties of "surgeries" and waiting-rooms; (2) a salaried service, which with all its difficulties and disadvantages is still better than the present system of capitation fee; and (3) the formation of a medical trade union to protect our more mundane interests. For those whose tender susceptibilities are hurt by the word "trade union" they can use some other name. For others who think that it is beneath the dignity of a noble profession to indulge in trade unions, I should like to inquire if they have heard of any miner, busman, etc., who, when offered the slightest affront or injustice, has not been instantly defended by his colleagues. Can anyone imagine G.P.s doing the same to-day?

I am fully aware that the last two proposals will anger a number of G.P.s, but I believe that if these proposals are instituted we will no longer hear the never-ending complaints from doctors and their wives with which we are all so familiar. The G.P. must understand that he cannot do good and decent work unless he forgoes some of his cherished notions which may have been applicable fifty years ago but are no longer valid to-day. We should therefore work and agitate for these three factors, because, if granted, only then will the G.P. straighten out his spiritual kyphosis and heal his mental malaise. And who knows, he may be even able to look his chronics and neurotics in the face and start to treat them intelligently for the first time. The alternative is to descend further into the mire of being mere money-grubbers, panderers to neurotics and chronics, and scribblers of certificates.—I am, etc.,

London, W.13. M. LASK.

SIR,—The *Journal* for March 25 contained three most interesting features. First, Sir Heneage Ogilvie's very able article "The Granny Racket" (p. 683); secondly, Dr. Bence's thoughtful and damning indictment of the N.H.S. (*Supplement*, p. 105); and, lastly, the leading article's (p. 709) very fair criticism of Dr. Joseph Collings's reconnaissance into general practice in England.

Sir Heneage Ogilvie emphasizes one important point—the loss of freedom in any State medical service. By freedom in medicine I do not mean freedom to do what I want, but freedom to do what I consider best for my patient, which is an impossibility to-day except in private practice. No one denies that an

efficient Service is essential in this rapidly developing world, but let the doctors have control of all purely professional matters. "Private practice should be encouraged," Sir Heneage writes, because, as I wrote in another place, in the past private practice set the standard and actually subsidized the panel service, and the preservation of independent practice will remain the surest guarantee of a good State service.

At a recent Hampstead divisional meeting we were told by a secretary from the B.M.A. that their policy was to encourage and help private practice in every way. I have yet to see any evidence of this at headquarters. The same gentleman told us that we had now accepted the Act. He did not seem unduly disconcerted when he was assured that many of us had never accepted the principles on which the Act was based.

Dr. Bence's letter sums up what many of us have been thinking for a very long time. The truth is that we have no leadership in a profession which has been consistently betrayed from the beginning of this sorry business. As regards Dr. Bence's query on the financial side, the Fellowship for Freedom in Medicine has suggested a scheme for grants-in-aid and provision of drugs. There is also the New Zealand fee-for-service, which Dr. Collings thinks could teach us a great deal.

I wish that Dr. Collings's reconnaissance had been more extensive; also that he had given his opinion of medicine as practised in solely private practices compared with those in the N.H.S. From his few examples the best-run practice appears to have been purely private, and the bias is all in this direction. I think his criticism of industrial practice is on the whole fair. Here we have the 4,000-odd patients, generally well "managed," and it is a good paying business concern, though it is certainly not medicine. He does appear to have underestimated the increased services expected of an N.H.S. practitioner, which Dr. Bence rightly considers is destroying medicine to-day.

My experience gathered from medical friends overseas leads me to the opinion that the real doctor–patient relationship is far more highly developed in Great Britain than elsewhere. This may partly account for Dr. Collings's opinion on the implication of the Act in this particular. I agree with Dr. Bence, and believe that this relationship, which is based on confidence, must disappear in a State medical service. To take midwifery out of the hands of the G.P. is the surest way of destroying this confidence. Your leading article says, "General practice should be made the most attractive of any career in medicine."

Let those who value security above all things seek their security in a State medical service, which can be and must be vastly improved on the Service of to-day. For the others who value their personal and professional freedom so highly private practice must be brought back to the state in which there is, in the words of Sir Heneage Ogilvie, "freedom for the doctor to follow truth where it leads him, freedom for the patient to seek help where he has confidence."—I am, etc.,

London, N.W.3. H. V. DEAKIN.

The G.P. and the Maternity Service

SIR,—After reading the address of Dr. D. W. James entitled "The General Practitioner and the Maternity Service" (March 11, p. 598) it is easy to see how the unseemly conflict between the Royal College of Obstetricians and Gynaecologists and the general practitioner is perpetuated.

The address ostentatiously made on behalf of progressive midwifery nevertheless contains a renewal of those attacks by the R.C.O.G. against the general practitioner with which we are only too familiar. I quote from the address on p. 602:

> "Nevertheless, we have not yet seen the full results of increased general-practitioner midwifery, and I suggest that you watch the future maternal mortality very carefully. If there is an increase in mortality then general-practitioner midwifery is finished for all time, for this is just the piece of evidence that is awaited by the authorities."

How can the insinuations in this be lightly passed over? Also reference to "increased midwifery" is to many general practitioners a gross misstatement of facts.

Then again do we really think that the fine work done by our midwives is attributable to the fact that they are responsible for all they do to the Central Midwives Board? We infer therefore that the G.P. who is responsible to no one makes a less impressive figure and stands or falls by any variation in the infant or maternal mortality rate. I suggest that the *Journal* in all fairness should publish a reply to refute the allegations and to defend the general practitioner against so unjust an attack.—I am, etc.,

Dorchester, Dorset. H. G. HARVEY.

Psychiatry for Physicians

SIR,—In Dr. Eliot Slater's review of two books under the heading "Psychiatry for Physicians" (March 18, p. 650), he writes that it would seem wise to provide (in a book for the non-psychiatrist) an account of what we know about the physiology of the emotions and show how this provides a frame of reference for the understanding of neurotic reactions, etc. I select this sentence as it indicates a weak spot. How an account of the physiology of emotions, addressed to the non-psychiatrist or anyone, could provide a framework for the understanding, and, may I add, what is at least as important, for the effective handling, of neurotic reactions appears completely nebulous—in the present state of physiology, one would add, unless one has had experience of the autonomy of the psyche.

On the other hand (while manipulation even of physiological relations with "somatopsychic" manifestations is mostly of superficial and temporary effect if it has any effect at all), a simple, understandable presentation of psychodynamics (this implies almost always some elucidation of unconscious causal, motivational, and final tendencies) can be digested and applied by open-minded people without too severe "complex" handicaps in their own psychology. One simple example may make this clear. The observation of parental intercourse by children is undoubtedly followed in some instances by a neurotic reaction. In, I daresay, the majority of cases it is not followed by such. Why this should be so cannot (yet?) be explained physiologically or psychologically. In some instances at least the disability can be understood in the individual, and remedied as well, by a "depth-psychological" approach. I believe it can be remedied occasionally by other psychological approaches. But how the present physiology, of emotions or anything else, could either understand or remedy such a disability I should very much like to be taught.

The somatic aspects, I venture to suggest, will take care of themselves—tendencies in medicine being what they are. The airier components of man, however, need much more looking after. For even psychiatrists, who would be expected to be very much interested in psychodynamics, express opinions the psychodynamics of which can only be inferred, such as that it is necessary to pursue paediatric studies before pursuing specialized studies in child psychiatry—a view that, *mutatis mutandis*, I doubt with utmost scepsis would be expressed by any number of paediatricians.—I am, etc.,

Dumfries. D. J. SALFIELD.

Aerosol Treatment with Penicillin

SIR,—I was glad to read of the interest in aerosol treatment which prompted Dr. E. H. Jeanes (March 11, p. 608) to comment on my letter (February 18, p. 441), and I should like to take this opportunity of replying to his interesting remarks and to the many other doctors who have written to me personally.

All the cases which I have treated were given the aerosol by the individual face-mask method. By this method alone, I feel, can the individual patient be sure of a reasonable concentration of penicillin vapour. The flow of vapour comes out at approximately six litres per minute—that is, of course, the vapour-air mixture. I have not yet tried the method of giving mass aerosol to a collection of patients in a small room or closed cubicle, but I feel that the infusion of only 4 mega units into 900 cu. ft. would be a far from sufficient concentration. I would, however, suggest that to save time in treating numbers of cases the makers of the machine could perhaps devise an apparatus with a number of leads so that perhaps six or seven individuals in hospital might take their treatment at the same time. Here again I do not know what concentration of vapour would be

needed, but for six people 3 million units of penicillin might be put in solution for five or six times.

The ages of my series of cases varied between 6 and over 60. They were taken at random, early and very chronic cases being found among the group, but all of them had been treated with known and accepted methods before the aerosol was given. These methods included vaccines (autogenous and stock), the usual expectorant and antispasmodic mixtures, elimination of the upper respiratory tract infection, and the cauterization of the nasal polypi, etc.

While aerosol treatment was being given some of the patients were kept on antispasmodic mixtures of the ephedrine, potassium iodide, and ethereal tincture of lobelia type, but they proved to get on no better and no worse than the others who were given this treatment alone.

All the patients given this treatment were those who did not respond to allergic testings and whose histories did not point to an allergic predisposition. I feel that it would be useless to treat such a case as, for example, a dust or feather asthmatic by aerosol, unless of course a true bronchitic element is superimposed, for such patients fare better when specific desensitization is carried out and the offending protein eliminated as far as is possible.

I unfortunately did not have the blood penicillin levels taken, but I feel that this, as suggested by Dr. Jeanes, would be a good practical measure in another series of cases.

Many patients when they begin to inhale the vapour tend to cough and wheeze quite a good deal, but this alone is not an indication for stopping the treatment, nor is the sore tongue of which most patients complain. The contraindications are, I think, (1) recurrent attacks of asthma of unusual severity, (2) severe tachycardia, (3) cyanosis, and (4) vasovagal fainting attacks. These, happily to say, are very rare, and I saw only two cases in my series of a hundred.—I am, etc.,

Liverpool. A. E. BERNSTIEN.

Leucotomy and Hypertension

SIR,—We welcome Dr. R. W. Tibbetts's case report, "Leucotomy and Hypertension" (December 24, 1949, p. 1452), as an important contribution to both psychosurgery and psychosomatic medicine, and we would like to support his conclusions because of a similar recent experience in a case of intractable pain and arterial hypertension which has shown a surprising response to leucotomy.

The patient was a senile woman of 65 who had previously failed to respond to all other forms of treatment—sedatives, E.C.T., and psychotherapy—until leucotomy was able to relieve her not only of her intractable pain but also to cause a fall in the high blood pressure to a normal level, which up to now appears to be maintained. The symptoms of this patient consisted—as the patient herself used to describe it—of "unbearable" pain, starting from inside the left ear and spreading over the left temporal and supraorbital region towards the top of the head, where it became particularly troublesome. The pains are said to have started in December, 1947, after an operation for "rheumatic facial palsy" (mastoidectomy with decompression of the facial nerve, which operation succeeded in correcting the previous disfigurement of her face).

The patient's complaints increased from month to month, and she had been investigated repeatedly in various hospitals, but no organic causes could be detected. The patient had become increasingly depressed and agitated, irritable and abusive towards her family, unable to sleep or to look after her home. After two suicidal attempts she was admitted to Warlingham Park Hospital on October 30, 1948. Her mental condition on admission and afterwards was characterized by an extremely hypochondriacal attitude with paranoid features. The physical examination revealed arteriosclerosis with marked hypertension and accentuation of second aortic sound. Her blood pressure was between 190 and 230 mm. Hg systolic and 100 diastolic. Examination of the fundi showed minimal retinal changes only. All other investigations (urine, blood urea, etc.) were normal. Although her previous personality appeared on the surface free from emotional instability, some unfavourable emotional relationships in early childhood and adolescence were to be suspected. We diagnosed this case as a chronic psychoneurosis with hysterical and obsessional features, in a personality predisposed to psychosomatic disturbances, prone to exaggerate a symptom in a hypochondriacal manner and to fix it in the way of a pathological conditioned reflex.

The subsequent history of the patient was as follows. The attempted psychotherapeutic approach was unsuccessful owing to the patient's complete lack of co-operation; she was much too self-centred and preoccupied with her complaints to be able even to concentrate on listening to questions. Repeated E.C.T. (15 shocks) had no appreciable effect, and the blood pressure showed no tendency to fall. Sedatives and narcotics brought only temporary relief. In these circumstances it seemed justifiable to do a prefrontal leucotomy in the hope of alleviating her symptoms, after fully explaining the exceptional risks of the operation to her husband. In view of the gross anxiety, with obsessional dwelling upon the same bodily sensations, and the otherwise well-preserved, intelligent personality of the patient, the operation should, in our opinion, have a chance of success.

The leucotomy performed was similar to that described by Hutton, Fleming, and Fox,[1] with slight modifications. In all but advanced schizophrenics it has been our custom of recent years to be content with a low cut, thereby avoiding large personality changes. In this case blood pressure readings were taken throughout the operation. Shortly before the operation the blood pressure was 230/100 mm. Hg. After thiopentone induction the reading was 190/90. No change was observed on incising the dura, but after leucotomy on the right side the pressure was 170/85. Immediately after doing the left side the pressure dropped to 135/75 and has remained unchanged at this level.

The patient's subjective condition became essentially altered. The previous "unbearable" pain disappeared, and the patient changed into a "different" person (as emphasized by her husband). Her usual very tense expression appeared relaxed; she became quiet and pleasant, taking real interest in the affairs of other people—quite contrary to her previous behaviour. Her marked improvement was followed after her return home by a new attitude to life, particularly to her family. She again shows affection towards her husband and daughter, and it was the impression of the social worker on visiting the patient's home that domestic happiness had been restored.

This obvious success should not be exaggerated, for the time of our follow-up is comparatively short. But in all modesty we feel justified in saying that at least a temporary solution has been found to a very complicated situation, and we hope that a more intensive aid in readjusting this patient will prevent a relapse.

May we, in conclusion, be allowed to add two further points to Dr. Tibbetts's excellent discussion of his case? More emphasis should be laid upon the experience of such a considerable and sustained fall of the blood pressure through leucotomy—an effect which we have never observed to such an extent in hypertensive patients treated with E.C.T. Secondly, old age as such need not be considered a contraindication to leucotomy with similar psychosomatic disturbances, provided the "human" indication is as pressing as in the reported cases. This would mean some alteration of the outlook for geriatrics, for not only does E.C.T. in old age seem to contribute to an increase of the recovery rate but in future leucotomy also is likely to make a similar contribution should the reported experiences of Dr. Tibbetts and ourselves be confirmed by other authors. We have already made a more systematic approach in this direction, and will report our results in due course.—We are, etc.,

J. R. CRUMBIE.
ARTHUR ZANKER.

Warlingham, Surrey.

REFERENCE

1 *Lancet*, 1941, **2**, 3.

Amateur Urology

SIR,—I wish to report a novel method of treatment for painless haematuria and acute retention of urine to which I was introduced by one of my patients aged 61 years. This man has had a urethral stricture since 1918, which has been dilated on innumerable occasions. During the past year he has had four severe attacks of painless haematuria, necessitating his admission to hospital, two attacks having been complicated by acute retention of urine. The cause of the haematuria has not been established despite exhaustive and, to my patient, exhausting investigations.

Two weeks ago, when consulting me about a cough, he told me that he had had a fifth attack of painless haematuria, which he had treated himself. This he did by stuffing an ointment consisting of one part "zambuk" and two parts petroleum jelly into his urethra. The haematuria ceased immediately, but two days later he developed acute retention of urine, which caused him great agony. He decided to treat this

condition also, relying on his vast personal experience of the treatment of stricture.

He bent a solid brass stair-rod into the shape of a urethral bougie and filed it until it was quite smooth. Using his ointment as a lubricant, he inserted this intrument into his urethra and allowed it to slide down as far as it would go. He pushed it past the last inch of resistance into his bladder and thus relieved himself rapidly. He has suffered no ill effects so far, except for the escape of a few drops of urine whenever he coughs. He explained that he knew he was taking his life into his own hands, but he was "fed up with hanging around hospitals." He has promised never to repeat the treatment.—I am, etc.,

London, W.11. DAVID SLOVICK.

Proguanil-resistant Falciparum Malaria

SIR,—I am glad that Drs. J. F. B. Edeson and J. W. Field have opened the subject of proguanil-resistance in falciparum malaria (January 21, p. 147). I hasten to support them from our experience in this part of India. Our clinical observations about the action of proguanil in falciparum malaria may be summarized as follows.

1. Proguanil controls the bouts of fever in 48–72 hours. But low fever without rigors may linger on for days in some cases.
2. The ring forms disappear rapidly from peripheral blood on exhibition of proguanil.
3. When the patient is still under proguanil treatment a large number of crescents appear in peripheral blood.
4. The above condition is associated with a well-marked haemolytic anaemia, rise of temperature daily to about 99° F. (37.2° C.), and a general deterioration in the patient's general condition.

Under these conditions treatment with antimalarial drugs in combination with penicillin, as described in a paper I wrote,[1] has helped to control the infection and leads to rapid recovery without relapses. Our experience during the last two years since the publication of the above observation (in about 100 cases) has confirmed our faith in this line of treatment. Discussion of the treatment on the basis of available knowledge is bound to be fruitless, since the knowledge we boast of is so infinitesimal and also since "facts are stranger than fiction." I therefore ask the workers concerned to try this treatment in resistant and relapsing cases of malaria, benign as well as malignant.—I am, etc.,

Poona, India. P. L. DESHMUKH.

REFERENCE

[1] *Ind. med. Gaz.*, 1947, **82**, 511.

Acute Inversion of the Uterus

SIR,—There are several significant points in the case of acute uterine inversion described by Drs. D. Crook, F. Kohn, and T. D. Lambert (March 25, p. 729). From the account given it seems likely that inversion of the uterus recurred almost immediately following reposition, for which the injection of ergometrine may have been partly responsible. The authors say that following replacement "the patient looked pale and ergometrine 0.5 mg. was administered intramuscularly. The pulse rate increased to 90 per minute and a few minutes later blood began to gush from the vulva. The patient collapsed. . . ."

Now the uterine fundus which has just been replaced from the inverted position is for a few moments very atonic; the tendency to sag in its upper part is still present. It is important that a hand be kept within the uterine cavity until the uterus contracts, otherwise a vigorous contraction—especially one induced by an oxytocic drug—will simply drive down the fundus again into the vagina. Failure to appreciate this, and therefore the cause of collapse and continued bleeding, may result in a further injection of ergometrine being given, which would simply aggravate the condition.

The reason for the failure to recognize that the inversion had recurred is almost certainly that "the uterine fundus appeared normal on abdominal examination," although it must have been inverted at that time. This is a most dangerous pitfall in the diagnosis of incomplete uterine inversion. The fundus is felt to be at the normal level on abdominal palpation, though vaginal examination shows that most of the body of the uterus is inverted and may be almost filling the vagina. More careful palpation of the uterus abdominally will probably show the presence of a small dimple; this may not be recognized as such, and nothing more may be made out than an irregularity in shape the significance of which is not recognized, as the height of the fundus above the symphysis pubis may be normal. A further fact pointing to the diagnosis was the persistence of severe abdominal pain.

Recurrence of inversion of the uterus following reposition is always a danger. Prompt measures for resuscitation should be instituted at once, followed by adequate replacement. How much better is this accomplished by an obstetric "flying squad" unit than following removal of the patient, perhaps many miles, to hospital by ambulance.—I am, etc.,

Manchester. C. J. DEWHURST.

Gastro-gastric Intussusception

SIR,—Mr. Alan Thompson (March 4, p. 525) describes a case of gastro-gastric intussusception caused by a malignant polypus. As this condition is an uncommon one, it may be of interest to record a similar case of my own.

A thin and anaemic woman of 66 was admitted to hospital giving a history of vague epigastric discomfort and poor appetite for one year. Four days before operation (which was on December 22, 1940) the epigastric discomfort became more severe and she began to vomit dark thin fluid. Her haemoglobin was 60%. There was a rounded palpable mass in the region of the pylorus, and the diagnosis appeared to be clearly one of carcinoma causing pyloric stenosis. On opening her abdomen, an intussusception was found, the antrum being invaginated into the duodenum, the total length of the intussusception being 4 in. (10 cm.). This was easily reduced. The stomach was opened and a sessile tumour, 1½ in. (3.75 cm.) in diameter, was removed from the posterior wall of the stomach, rather towards the greater curvature. The stomach was repaired. Convalescence was normal. Histologically the tumour was a malignant papilloma.

—I am, etc.,

Farnham, Surrey. S. C. RAW.

Anaesthesia for Fenestration Operation

SIR,—We have read with interest correspondence on the subject of anaesthesia for the fenestration operation. Induced hypotension appears to us to give most consistently the degree of haemostasis necessary. The work of Gillies on total spinal block has led to the development of a technique combining high spinal block with light general anaesthesia for this type of operation. Good results have been obtained during the past eighteen months; in one case, during a Portman's operation, in which this method was used, the dura was opened and there was a loss of cerebrospinal fluid. The patient lived for four days without regaining consciousness. We feel attention should be drawn to the possible danger of this technique when there may be loss of cerebrospinal fluid. A less elaborate routine using pentamethonium bromide is now being tried.—We are, etc.,

Lincoln. A. C. FRASER.
M. SPENCER HARRISON.

Synchronous Double Primary Carcinoma

SIR,—It may interest readers of Dr. T. B. Williamson's medical memorandum (March 18, p. 648) to know that some 23 years ago, while in practice in Lancashire, I was consulted by a single woman aged, to the best of my memory, about 40, who had a fairly early, freely movable carcinoma about the size of a walnut in the right breast, with a palpable axillary gland, while the left nipple was almost obliterated by Paget's disease. I sent her to my old teacher, the late Professor Blair Bell, at Liverpool Royal Infirmary, who did a radical mammectomy on the right side at a first operation, and removed the left breast a fortnight later. The double diagnosis was confirmed by the microscope. The patient appeared to go on well for a few months, but developed intrathoracic metastases from which she died about a year after the operations.

I regret that after so many years I cannot give a more precise clinical report of what must surely be a considerable rarity. I have, however, a very distinct recollection of "catching a rocket" from Blair Bell, because, while assisting him at one of the operations, I cut a ligature with the point of the scissors instead of with the heel. This incident, though trivial in itself, demonstrated the eagle-eyed watchfulness and minute, almost fanatical, attention to technical detail which marked the work of a master surgeon whose memory is still held in honour by his old students and house-surgeons—not least by myself.—I am, etc.,

Deal, Kent. M. LETHBRIDGE FARMER.

Massive Enlargement of Breasts

SIR,—This rare condition is seldom met with. It is said such authentic cases on record are less than 100, and these breasts may attain the weight of a kilogram or even more. But in this case the weight has exceeded this limit. Both the breasts weigh, in all, 18 lb. (7.2 kg.)—the right breast weighs 11 and the left 7 lb. (4.4 and 2.8 kg.).

A Brahmin girl aged 15 was brought into Sultania Zanan Hospital by her mother-in-law for treatment for huge breasts, which were hanging below the inguinal ligaments on both sides. She was brought in from Gadarwara in Central Province, and such enlargement has not been seen elsewhere in the district. Owing to the weight of the breasts the girl could not walk properly, and the enlargement interfered greatly with her normal life. She had been recently married; it is customary in Hindus and Mahomedans always to veil themselves in the presence of others till some time after the marriage, and in some cases till a child is born. This girl also kept herself covered from near relatives, till one day she fell down owing to the weight of her breasts.

The enlargement had occurred gradually over two years. The breasts were hard and smooth, and freely movable on the chest wall. The right breast was removed under ether anaesthesia; it came off easily with an elliptical incision, and to the naked eye it was made up of normal breast tissue. The left breast was later removed by the same method. The cause of the enlargement could not be ascertained.

—I am, etc.,

Bhopal, India. AHMED BAKHSH.

Health and the Soil

SIR,—I would like to endorse every word in Dr. E. H. Eason's letter (March 25, p. 731) about the "diet of calories" on which we exist and the "unnatural" treatment of flour. The operative word here is "unnatural." Why do we need to bleach and ripen our flour by adulteration with foreign, and possibly toxic, chemicals? Why do we need a snow-white loaf any more than snow-white biscuits? What is wrong with natural-coloured and naturally matured flour? The answer is that the natural process of maturing takes a little longer, and so locks up the miller's capital for a while. Public taste could soon be educated, as it was 20 or 30 years ago, to the "national loaf" if nothing but high-extraction pure wheat flour were offered, free from foreign substances. The extra vitamins at present added could then be fed to the pigs, while we take the natural product containing all its known vitamins, as well as the (possibly) whole alphabet of unknown but equally necessary ones for ourselves.

Again, referring to Dr. Donald Hunter's paper about the protection of the worker against injury and disease (February 25, p. 449, and March 4, p. 506), I would recommend readers to read *The Living Soil* by Balfour. This book demonstrates that healthy soil in a fertile state is a teeming hive of life and industry. We in our "scientific" cleverness cannot efficiently replace this process by artificial "fertilizers" any more than we could live on syr. glycerophos. co. and mineral fats and oils. What are we doing with all this life? We are first depriving it of its raw materials—animal and vegetable compost—then poisoning it with such powerful and indiscriminate poisons that even the workers must be protected, as from mustard gas, in their use. Even so, severe illness and even death has occurred.

We are sterilizing the soil and rendering it barren, paving the way for soil erosion and loss of fertility, and growing crops that may be bulky but deficient in various constituents and prone to pest attack and disease, like the bulky but unhealthy child with rickets. We commit other sins against our soil: we dress some of our cereal seeds with mercury (another protoplasmic poison), we spray our trees (and the soil under them) with tar oil, D.D.T., and other things—all quite indiscriminate killers of beneficial as well as harmful life. Proper cultivation, using the natural fertility of the soil and conserving it with animal and vegetable compost and putting back into it the organic material that we take from it, reduces the incidence of pest attack and disease in the crops by strengthening their own inherent resistance. Feeding on them in a fresh state, unspoilt by chemical ripening, canning, freezing, or other artificial forms of treating them, in turn would breed a more robust and resistant population—preserving the balance of nature ordained by a wiser Mind than even our scientists.—I am, etc.,

Bedford. F. KEITH HAYMAN.

Protection of the Worker

SIR,—Dr. Donald Hunter's articles in the *Journal* (February 25, p. 449, and March 4, p. 506) prompt me to record two cases of occupational illness in which notes of Dr. Hunter's lectures delivered many years ago proved invaluable.

In September last year a ship's engineer aged 29 consulted me, complaining that the previous night he had difficulty in returning to his ship. He behaved as though drunk, but had taken no alcohol. He was giddy and felt unsteady on his legs, which were weak. His appetite was poor. On examination he was pale and sunken-eyed and had a dirty tongue. He walked with difficulty and his gait was unsteady. The only positive physical signs were fine lateral nystagmus in both eyes, coarse tremor of tongue, diminished power and tendon reflexes in lower limbs, and hyperaesthesia to pin-prick of the calves. There was no loss of sense of position. Two days later the nystagmus was more pronounced, and the knee-jerks could not be obtained. The blood pressure was 105/75 mm. Hg and the urine normal.

The most marked feature of his illness was mental disturbance. During the day he was normal but at night he was prey to terrors and delusions. One morning he said he had been abducted in the night by a man who passed through his body, died in the process, and came out through his toes. He believed that because this man died he would die too. Though stated calmly in broad daylight this experience was evidently very vivid to him and he was quite convinced of its reality. He dreaded the onset of each night, during which these terrors were accompanied by visual hallucinations, but he was not clear what he saw.

I went aboard his ship to interview the captain, who said that the engineer had recently spent most of his time repairing the refrigerator plant, the valves of which were incompetent. I inspected the plant and found that the gas had to be allowed to escape every time the valves were repaired. The gas used was methyl chloride. I was uncertain whether methyl chloride was poisonous, but, knowing that related hydrocarbons were, I drew a bow at a venture and informed the captain that the plant was dangerous. Reference to Dr. Hunter's notes confirmed the diagnosis.

The patient was given 100 mg. of aneurin and 200 mg. of nicotinamide daily for five days with improvement (not of course necessarily due to the treatment), and although muscular weakness was slow to recover he was fit to be discharged after three weeks. Dr. Hunter quotes the mortality as up to 35%.

The second patient, aged 33, was admitted three weeks ago with a three-day history of malaise, shivering and fever, severe pain in the back and eyes, and cough with sputum. Twenty-four hours before the onset of symptoms he had been cutting galvanized-iron piping with an oxy-actylene flame for thirty to forty-five minutes and had inhaled a heavy cloud of fumes (no mask was used). On examination he was an ill man, with a temperature of 103° F. (39.4° C.), a flushed face and skin, a heavily coated tongue, but no other abnormal signs. I was puzzled. At the back of my mind was a faint recollection of "metal-fume fever," but was the metal zinc? I could not remember. Again Dr. Hunter's notes supplied the answer. The fever fell by rapid lysis in three days. On the eighth day the sputum was blood-stained (radiograph normal), but otherwise he made an uninterrupted recovery and was discharged fit on the tenth day.

I am indebted to my resident medical officer, Dr. Laetitia Bruce, for assistance with these patients.

—I am, etc.,

King George V Merchant Seamen's Memorial Hospital, Malta. A. L. CRADDOCK.

Psoriasis and the Adaptation Syndrome

SIR,—I agree with Dr. F. L. Lydon (March 18, p. 668) in thinking that it would be wrong to adapt Professor Hans Selye's theories too completely to the problem of psoriasis, and agree, too, in thinking that infection (in predisposed persons) is at the root of the matter—with the accent on the sinuses. But I consider that infection acts on the calcium–vitamin D metabolism of the body and skin by impairing the action of the parathyroid glands, which are highly susceptible to this form of attack.

The undoubted familial incidence of psoriasis is, I think, concerned with place as well as race—the sunless place, the nervous race. For instance low lying, misty, sunless places, where little ultra-violet light struggles through to irradiate vitamin D into being on the sufferer's skin; and the insensitive, highly strung personality, with, perhaps, also a bony configuration of the face tending towards chronic sinusitis (a sinusitis easily acquired in the sunless place) and with an inherited inability, too, to absorb a sufficiency of vitamin D for his body's needs. This type of personality seeks, accepts, and stands up to responsibility, but shows the strain of this and also of repeated, but suppressed, irritation in waves of psoriasis at the sunless seasons of the year. It is hard to understand why this should happen unless repeated releases of adrenaline can also affect the parathyroids, or unless we accept the target-organ theory in its entirety, which I for one am not prepared to do.

I believe that freedom from strain, residence on hills, and vitamin D (in one large 150,000-unit dose)—not during the winter, but in the summer, when Nature gives it, from May to September—is the answer for the G.P., with of course all due attention to sepsis. The reason for the often disappointing results in vitamin D therapy is, I believe, due to the quick resistance-reaction of the body to this toxic vitamin, whether it is given externally or internally.—I am, etc.,

St. Neots, Hunts. C. F. PATTERSON.

Definition of Senility

SIR,—Herewith some suggestions in answer to Mr. Fred Messer's letter (March 18, p. 674):

Senility—pathological exaggeration of the normal ageing process.

Senile—term applied to one who exhibits senility as defined above.

A certain degree of intellectual deterioration is the normal accompaniment of ageing; an exaggeration of this deterioration amounts to dementia. Those who are "pathologically" old can exhibit one feature of old age to a greater degree than other features, so that the term senility may well embrace both dementia or frailty, which are mentioned by Mr. Messer.

I feel that the word "senility" by itself should be used as a medical diagnosis as infrequently as possible. So often a more searching examination of a patient with this diagnosis will reveal pathological changes to which a more definite label can be attached.—I am, etc.,

London, N.W.1. GERARD CROCKETT.

The Granny Racket

SIR,—It was with some misgivings that I noted on the cover of the *British Medical Journal* of March 25, heading the table of contents, "The Granny Racket," by Sir Heneage Ogilvie. My fears were only too well founded—the slogan meant what it said. Not being a *Digest* fan, I must plead ignorance of Harold Stassen's articles, so that they are not "meat and drink" to me and I have shed no glycerin tears over the particular imaginary Granny who died of pneumonia for want of a National Health Service bed. Nevertheless, it is impossible to let a caption of this type pass without comment, for if there is one part of the National Health Service which is crying out for criticism it is surely the case of the aged infirm. A nation deserves to be judged by the treatment that it accords to its old people.

It is just simply not true that "Granny could have got a nurse to look after her at home at the Government's expense." Many hospital beds are lying idle because of the shortage of nurses. What use would "unlimited blood transfusions and unlimited chemotherapy" be to Granny? What Granny needs is someone to shake up her pillows, to give her a drink with her sulphonamides, and to lift her on to the bedpan when necessary. Any doctor who is at the present time trying to cope with a busy general practice could verify that the difficulty of getting aged patients who are ill adequately looked after is something very real and often pathetic in the extreme. The same statement holds good for the chronic sick of any age.

Last but not least, what is to be said for the provision for our senile? Has it ever reached the stage of a blueprint, or is it still merely an embryonic idea as yet barely stimulating the grey matter of some Civil Servant in a department of the Ministry of Health? Granny and Grandpa are even less likely than the horse to get grass, for their days are numbered. In conclusion may I suggest that readers should disregard the concluding sentence in this stimulating article? We *must* "worry over Granny," and keep on agitating about her treatment when illness overtakes her until what amounts to a national disgrace ceases to be.—I am, etc.,

Belfast. E. M. HICKEY.

Mongolism

SIR,—Dr. A. R. Graham (March 25, p. 706) reports the case of a mongol, one of twins, who up to the age of approximately 2 years had been successfully treated with thyroid and anterior pituitary extracts. Unfortunately the present condition of this child is unknown. In the past, numbers of mongoloid children have been treated by various investigators with combinations of thyroid and pituitary extracts. Other hormonal combinations have also been used. In practically all these cases initial successes have been reported, which, however, did not last long, and in no case has hormonal treatment succeeded in achieving what thyroid extract does in cretinism.

As I have pointed out in my monograph on mongolism, we have to deal here with a condition of mal- or under-development of the various organs ("unfinished child"), including, of course, hypoplasia of endocrine glands. It is therefore only natural that thyroid and pituitary extracts will have some, if only transitory, success. Mongolism, however, is not due to a glandular dysfunction as is the case in cretinism, and so no permanent benefit will ever be derived from such treatment. If lasting success is reported, then the case was obviously not one of mongolism but of infantilism or cretinism.

As to the causation, Dr. Graham's case is quite illustrative. The mother was 40; there had been a gap of 12 years from the birth of a normal girl; and three miscarriages had occurred in the intervening period. Does one require more to illustrate that a pathological condition of the uterine mucosa was the responsible factor?—I am, etc.,

Caterham, Surrey. M. ENGLER.

Training of Medical Artists

SIR,—I should like to express my admiration of the wise criticism by Professor Geoffrey Jefferson (March 25, p. 728) of the proposed training of medical artists at one school only. The demand for medical artists is growing and widening in its scope, and the medical profession will have little use for the "stereotyped idiom" in the near future. One position may require the traditional drawing of pathological specimens, but another may require knowledge of animation for films, moulage, and the designing of exhibitions. Such differing requirements need a far wider training than any one school can give. May I suggest that there are two solutions? The present custom could continue of training students as apprentices or assistants to established artists, where they learn the traditions of that particular hospital. This at least allows the student freedom of choice where and with whom he works, and when seeking a job he will be judged to some extent by the reputation of the department that has trained him. The second method is to establish a central body controlling the number of students trained each year and arranging their course of study to cover several different hospitals for perhaps four months at each. There they will come into contact with the widest range of medical illustration, have the advantage of working under several different teachers, and be able to discover their greatest

interests and talents. The very real risk of stylization will be removed, provided a sufficiently catholic group of hospitals is chosen.

The Association of Medical Artists can give invaluable service to the medical profession, but the position is absurd if the employee is to dictate to the employer about the type of work that is required.—I am, etc.,

Guy's Hospital, London, S.E.1. SYLVIA TREADGOLD, Senior Medical Artist.

Malayan Institute for Medical Research

SIR,—Among the losses sustained by the Institute for Medical Research in Malaya during the Japanese occupation were the portraits of several of the former directors. The loss is unfortunate, as we had hoped to make use of a fifty-year series of portraits for a historical memoir planned for the Institute's half-centenary this year.

The missing portraits are those of Dr. Hamilton-Wright, M.D. (McGill), and Dr. Henry Fraser, M.D., M.R.C.P. Dr. Wright retired to America after leaving Malaya in 1903 and died in Washington, D.C., in 1917. Dr. Fraser was born, I believe, in Aberdeen. He retired from Malaya in 1916 to live in Scotland, where he died in 1930. I would be grateful to any of your readers who could put me in touch with surviving relatives.—I am, etc.,

Institute for Medical Research, G.P.O. Box 1005, Kuala Lumpur, Federation of Malaya. JOHN W. FIELD.

POINTS FROM LETTERS

Spoons as a Measure

Miss MARY C. ISLIP writes from Paddington Green Children's Hospital, London, W.2: The British Standards Institution, after discussion with the Pharmacological Society and the Ministry of Health, have now extended their original specification on measuring cups and spoons to include a standard tea- and tablespoon for measuring the dose of medicine (see note in *Journal* of March 25, p. 692). As a pharmacist, may I say how welcome is this recommendation? Apart from the wide difference between the standard cooking spoon and that for medicine, the variation in the size of household spoons, particularly the teaspoon, is considerable and can give rise to inaccuracy of dosage, maybe with serious consequences where a potent drug is concerned. The public, parents especially, will, I am sure, appreciate the suggestion of such standardized spoons. I hope that they will soon be available and that every encouragement will be given to use them.

Maclean's Powder

Dr. J. T. MACLACHLAN (Glasgow) writes: Dr. Hugh Maclean got the credit of introducing an alkaline powder which was found to be curative of duodenal ulcer. I believe Trousseau was the first to introduce an alkaline powder for gastric complaints. Some 25 years ago I began to treat duodenal pains with the following powder: bismuth carb. 1 oz. (30 g.), potas. bicarb. 1 oz., pulv. zingiber 1 dr. (4 g.). The dose was a teaspoonful stirred up in water before meals thrice daily. I advised patients to eat plenty of soft foods at mealtimes, such as mashed potatoes, boiled or steamed white fish, poached eggs, milk puddings, and to avoid hard, tough, or greasy food. A large meal is the best antacid. The results were dramatic. I cured myself, after suffering with duodenal pains for years, in a matter of days. I advised patients to take the powder for three weeks. Usually within a week all pain is gone.

Definition of Senility

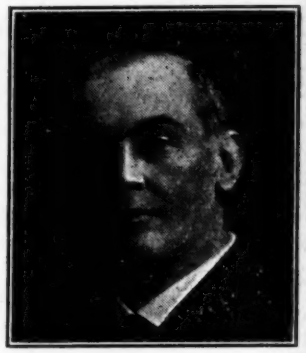
Dr. CHARLOTTE S. VINES (Newport, Mon.) writes: May I write a personal note on senility? When my mother was 91 years old (she lived to be 93) she said to me, "Promise me they won't put 'senile' or 'senility' on my certificate when I die." I had a twinge of conscience, for I had quite often, without much thought, put down that same word on the death certificates of the aged. I then asked several people what they understood by the word senile. To all it was more or less a word of contempt. Taking the various answers, I found to most people it meant someone old, stupid, silly, tiresome, bed-ridden, daft, childish, feeble-minded. . . . Surely "died of old age" is a kinder and more gentle description.

Obituary

THOMAS WILSON, M.D., Ch.M., F.R.C.S.

Dr. Thomas Wilson, as he was called by generations of people in the Midlands (for although he was a distinguished professor of gynaecology he did not care for the surgical "Mr." or the academic "Professor"), died at Malvern on March 23 shortly before entering his ninetieth year. Among his close contemporaries were Almroth Wright, Gowland Hopkins, James Berry, and several distinguished medical men well known in Birmingham.

Although born of Scottish parents at Cumnock, in Ayrshire, Thomas Wilson spent his boyhood in Wolverhampton, where he attended the Wolverhampton School, and he received his medical training at University College and Hospital, London, graduating M.B. in 1883 and proceeding M.D. in 1885, after winning medals in pathology and hygiene. A fellow student and close friend was the late Harry Littlewood, afterwards well known as a surgeon at Leeds. Wilson's early training was unusually wide: he studied midwifery at the Rotunda Hospital in Dublin; after qualifying he was a resident at the Royal Eye Hospital; and then for two years he worked at Queen's Square as a resident medical officer under Ferrier, Hughlings Jackson, and Victor Horsley. Twelve months as ship surgeon with the P. and O. line was followed by a period in general practice at Cannock, where he married Miss Loxton.



In 1890 Wilson seized the opportunity of returning to hospital practice by securing an appointment as honorary gynaecological surgeon at the Wolverhampton General Hospital (now the Royal Hospital). Three years later, just before taking the F.R.C.S., he was made assistant obstetric officer at the General Hospital, Birmingham, and he set up as consultant in Birmingham. His senior colleague, Dr. (later Sir Edward) Malins, belonged to the old school of physician-obstetricians, but Wilson joined enthusiastically in the development of gynaecological surgery. At that time Lawson Tait's work in this field was at its zenith. In 1903 Wilson was elected to the full honorary staff of the General Hospital, and in due course he became consulting gynaecologist and obstetrician to the hospitals at West Bromwich, Sutton Coldfield, Nuneaton, Dudley, and, towards the end of his active career, at Dudley Road Hospital, Birmingham.

Thomas Wilson joined in 1895 the staff of the Birmingham Lying-in Charity, which provided four district midwives who attended poor women in their homes. Recognizing the need for in-patient accommodation in the town for cases of difficult labour, he pressed for the establishment of a maternity hospital. The Midwives Act of 1902 required that all midwives should be qualified by proper training and examination, and this made more urgent the need for a training school for midwives, as well as for medical students. In those days the students received some instruction in the maternity department of the Queen's Hospital. Wilson's strong lead, supported by generous benefactors, led to the creation of the Birmingham Maternity Hospital, which was erected in Loveday Street, opposite the General

Hospital, in 1907. He was senior surgeon of this excellent institution until his retirement in 1922.

From 1912 until 1924 Thomas Wilson was Professor of Obstetrics and Gynaecology in Birmingham University and an examiner at London, Manchester, Bristol, and Leeds. Deeply interested in the pathology of the conditions he was called upon to treat, he maintained a small pathological laboratory alongside his hospital unit, and his writings and lectures bore testimony to the sound foundations on which he built up his contributions to knowledge of this branch of medicine. Of his many published papers perhaps the most noteworthy were the Ingleby Lectures in 1907 on "Pelvic Inflammation in the Female"; and his early and authoritative researches on uterine cancer. His extensive practice, both in midwifery and in gynaecological surgery, followed the trend of the times; he began his career when obstetricians were beginning to do operative gynaecology, and when he handed over the reins of office in 1921 to Mr. Beckwith Whitehouse, as he was then, a widely recognized school of gynaecological surgery had already been established at the General Hospital. Wilson was a pioneer of the best type; he was progressive and keen, but he was careful and sound—even cautious—both in precept and in practice. His patients and his students had the utmost confidence in him, and, although a somewhat deliberate operator, the standard of his results was uniformly high. There are still many doctors and patients who recall his association with Sir Gilbert Barling, his surgical colleague, in their nursing-home at 87, Cornwall Street.

Wilson was a man of outstanding character, of sturdy physique, and of a balanced intelligence. His common sense, the merry twinkle, the carefully enunciated speech, and the strong jaw will be recalled with affection by those who knew him. He disliked humbug and sarcasm, and he was sincere and kind. Even in his younger days games and field sports did not attract him, but he enjoyed his hobbies. He was much interested in field geology, and he was a particularly keen and skilful gardener. Dr. and Mrs. Wilson had no children. After his final retirement in 1927 they lived on the slopes of the Malvern Hills, where Mrs. Wilson died in 1947, and there until the day he died Thomas Wilson enjoyed the long evening of a useful life.—H. W. F.

Dr. JOHN STIRLING, who died suddenly on January 14, was senior anaesthetist to the Victoria Infirmary, Glasgow. He graduated B.Sc. at Glasgow University in 1913, and his medical course was interrupted when he went to France in August, 1914, as a combatant officer. He was a captain in the 8th Argyll and Sutherland Highlanders. In 1915 he was allowed home to complete his medical course, and graduated M.B., Ch.B. with commendation in 1916. Three days after graduation he returned to France as a captain, R.A.M.C. In 1917, while attached to the 112th Brigade, Royal Field Artillery, he was awarded the Military Cross "for conspicuous gallantry in attending the wounded under heavy fire." Demobilized in 1920, Dr. Stirling became a house-surgeon at Glasgow Royal Infirmary, and thereafter spent two years as a medical officer in Belvidere Fever Hospital. In 1922 he joined the late Dr. John Ritchie in practice at Dunoon, where he worked until 1925, when he took over Dr. O. H. Mavor's practice in Langside, Glasgow, and became dispensary physician to the Victoria Infirmary. About this time Stirling began to take an interest in anaesthetics, and in 1927 he was appointed anaesthetist to the Victoria Infirmary. His ability and aptitude in this branch were quickly recognized, and it soon became impossible for him to undertake both general practice and the practice of anaesthetics, so from 1935 he concentrated entirely on the latter, taking the D.A. in 1938.

Mr. Robert Tennent writes: John Stirling was a first-rate clinician, and this had much bearing on his great skill and safety as an anaesthetist. I have great reason to be grateful for that skill. We worked together in friendship and harmony for many years, and no surgeon could have enjoyed greater immunity from the dangers and risks of the anaesthetic than I did. He was blessed with a grand sense of humour and a temperament which never allowed him to get flurried. The same courage which was displayed in France was with him always, and he had the faculty of inspiring confidence and affection. His first coronary attack was in 1943, but he continued bravely, with recuperative intervals, until the end. In 1928 he married Evelyn Mary Wotherspoon, for whom sincere sympathy is felt by a large circle of friends.

Dr. ROBERT HONEY WATT, who died in a nursing-home in Edinburgh on February 23, was the only son of the late Sir George Watt, the distinguished botanist. He was educated at St. Paul's School, London, and at Edinburgh University, where he graduated M.B., Ch.B. in 1904, proceeding M.D. in 1908. After a term as house-surgeon at the Dumfries and Galloway Infirmary he became assistant to the late Dr. Peter Murray Kerr and then private assistant to Mr. Alexander Miles in Edinburgh. Following a short spell in Dunbar, Dr. Watt came to Langholm, Dumfriesshire, over 40 years ago and built up an extensive and successful rural practice which he carried on until his death. He was an active member of the B.M.A., and was chairman of the Dumfries and Galloway Division in 1934–5, president of the Border Counties Branch from 1939 onwards, a representative at the A.R.M. held in London in 1947, and he had been chairman of the local medical committee for Dumfriesshire since the start of the N.H.S. He served in the R.A.M.C. during the 1914–18 war. Dr. Watt was an outstanding country doctor. An able diagnostician with a strong personality, he was uniformly courteous, sincere, and kind. Besides leading a busy professional life he took a great interest in the affairs of his adopted town and district and served for some years on the town council of Langholm. He had a wide knowledge of the historical associations and folklore of the Eskdale and Liddesdale valleys, and his hobbies were photography, horticulture, and angling. His death is a grievous loss to his many patients, as well as to his colleagues and friends. He leaves a widow, two sons, and a daughter. His elder son, Dr. George Watt, was in partnership with his father.—J. T. McG.

Dr. HARRY BECKETT-OVERY, who died in London on February 27 at the age of 75, was the eldest of the thirteen children of the late Henry James Overy, of Brenchley, Kent. After leaving Kent College, Canterbury, he entered Swanley Horticultural College to train as a farmer, but showed so great an interest in science that he was urged to enter the medical profession. He graduated M.B., Ch.B. at Edinburgh in 1902, and took the F.R.C.S. in 1904 from the London Hospital, proceeding M.D. in 1906. His student career was full of promise, and he came to London eager to make his name as a specialist in gynaecology and obstetrics. To begin with he worked hard at coaching students. Then he went into practice in South Kensington, and it was at about this time that he married Miss May Beckit and added her name to his own, with a modified spelling. Because of his interest in pathology he came to know Dr. (later Sir Bruce) Bruce-Porter, and with his help Beckett-Overy was able to build up a West End connexion as a general practitioner. He had early moved from Kensington to Lowndes Street, where he remained for many years. He was contemplating retirement in June of this year, had he not been overtaken by his fatal illness. In the 1914–18 war he worked strenuously at the officers' hospitals in Londonderry House and Dorchester House, and was officially attached to the British delegation to the Peace Conference in Paris in 1919. Right through the recent war he remained in practice in London. His appointments at different times included those of casualty officer and pathologist at the Metropolitan Hospital, surgical registrar and assistant surgeon at the Kensington General Hospital, and consulting surgeon to the Cobham and District Cottage Hospital. He became a member of the B.M.A. soon after qualifying, and was a representative at the Annual Representative Meeting in 1909, and again in each of the next three years. He was honorary secretary of the Section of Obstetrics and

Gynaecology at the Birmingham meeting in 1911, and he had also been honorary secretary of the Kensington Division. He is survived by his only child, Mrs. Horsbrugh; Mrs. Beckett-Overy died some years ago.—H. R.

Dr. HUGH ARWEL THOMAS died suddenly on February 24 at Wrexham. He was educated at Ruabon Grammar School and the University of North Wales, where he took the B.Sc. At the outbreak of the 1914–18 war, as a result of his outstanding work at Bangor, he was chosen with two other graduates for research work in the laboratories of the Royal Flying Corps. After the war he resumed his studies at Bangor University, and in 1919 he obtained the degree of M.Sc. He then decided to venture into the field of medicine; and at Liverpool in 1923 he graduated M.B., Ch.B. In the following year he took the D.P.H. Dr. Thomas was assistant resident medical officer at Highfield Sanatorium, Liverpool, and afterwards acted for short periods as a locumtenent in general practice. He entered the public health service in 1925, his first appointment being that of deputy medical officer to the Denbighshire County Council. Later he succeeded to the senior position on the retirement of Dr. T. Roberts in 1936. During the recent war he organized, in collaboration with Sir William Jones, then clerk of the Denbighshire County Council, all the medical services under the county A.R.P. scheme. Dr. Thomas marshalled many of his department's schemes through the difficult and often turbulent channels of committee, but the opposition to his studied proposals was never formidable. Not only were the members, generally, aware that he was a man of modest and retiring personality who never sought the limelight, but they relied on his sincerity, his mastery of his subject, and his mature comprehension. He made himself familiar with all details of the work of his department and had a rare gift of assimilating the complexities of statutes and departmental regulations. He had great personal charm and was always courteous and considerate to all the members of his large staff. Though a man of few words, his many acts of kindness and generosity will be remembered by a host of people. Dr. Thomas was a keen sportsman and an adept at golf, hockey, billiards, and fishing.—J. T. P.

Dr. WILLIAM EDMUND HARKER died at his home in Croxdale, Co. Durham, on March 2. He was in his 80th year. He was a Novocastrian—born and bred at Newcastle-upon-Tyne—the eldest son of Alderman W. E. Harker. He was educated at Durham University, where he qualified in 1893, proceeded M.D. in 1895, and D.Hy. in 1899. During the early part of his career he practised at Tynemouth, and was the first medical officer of health appointed to the River Tyne ports. He served 40 years with this authority, during which period the Tyne was never declared an infected port. It is recorded that he was Britain's first port medical officer to fumigate ships as a plague preventive method. A floating hospital at Jarrow was in his charge to facilitate the detection and disposal of imported infectious maladies. In 1908 Harker received the appointment of medical Inspector of Aliens for Tyne Ports.

With the formation of the Tyneside division of the R.N.V.R. he received his commission as naval surgeon to the Tyne—the first appointed—based in H.M.S. *Satellite*. During the first world war he was largely responsible for the fitting out of the hospital unit, H.M.S. *Plassy*, a later component of the Grand Fleet at Scapa Flow. Later he became senior medical officer to the Tyne Naval Depot, where he elaborated a scheme for the landing of casualties after a fleet action which bore fruit after the Jutland engagement. He retired as surgeon captain, R.N.V.R., with Volunteer and British Empire decorations.

He leaves behind him two sons.—W. J. P.

Dr. ERIC BARLOW BROWN died suddenly on March 3 at the age of 56. Born in Preston, Dr. Brown was the elder son of the late Dr. D. W. Barlow Brown. He was educated at Leys, at Caius College, Cambridge, and at Edinburgh, where he graduated M.B., Ch.B. in 1918. Dr. Brown joined the Army in August, 1914, immediately on the outbreak of war, and served in East Africa in 1914–16 with the 2nd Battalion, the Loyal North Lancashire Regiment. At the end of 1916 he was invalided out of the Army and returned to study at Edinburgh University. He acted as house-physician at the Edinburgh Royal Infirmary before settling down in general practice in Oldham. Dr. Brown was appointed to the staff of the Oldham Royal Infirmary in 1921, and his long association with this hospital ended only last year, when he retired as senior surgeon. In addition to carrying on a large practice he held the appointment of medical officer to the Hulme Grammar School, and he also worked hard for the local branch of the Red Cross. Dr. Brown had been a very keen athlete, winning a half-blue for lacrosse while at Cambridge and playing in the rugby fifteen at Edinburgh. Owing to ill health he was obliged to retire from practice in the autumn of last year, and he went to live at Towyn in Merionethshire.

J. A. M. writes: Eric Brown was beloved by all who knew him. He radiated good will and kindness of heart and was popular and respected wherever he went. He was patient, hard-working, and conscientious, and where his patients were concerned nothing was too much trouble. Among his professional brethren he was always welcome. His ready smile, eager zest, and unruffled spirit made him a happy companion. A great rugger forward in his 'varsity days, he retained his interest in sport of all kinds, and nothing gave him greater pleasure than a sunny afternoon at Old Trafford or a round of golf with his friends. His health had begun to suffer as a result of years of overwork, and when he decided to retire from general practice his friends hoped he would be long spared to enjoy a quieter life. That was not to be, however, and we have to mourn a charming personality and a gallant gentleman.

Dr. THOMAS MCKELVEY died on March 5 at his home in Penylan, Cardiff, at the age of 76. A student of the Royal University of Ireland, he graduated M.B., B.Ch. in 1898. After successive appointments as house-surgeon and R.M.O. at the Galway County Hospital and as lecturer in pathology at Queen's College, Galway, he settled in general practice in Cardiff in 1901 in partnership with the late Dr. James Robinson. He soon built up one of the largest practices in Cardiff. An active member of the local executive committee and of the Branch Council, Dr. McKelvey was appointed chairman of the Cardiff Division of the British Medical Association in 1936–7. He also represented his Division at the Annual Representative Meetings in 1935, in 1937, and in the two succeeding years. For many years he was a member, and later chairman, of the local panel committee. Dr. McKelvey was a keen committee man, and his honesty of purpose and plain common sense made his contributions invaluable until a few years ago, when increasing deafness forced him to give up these activities. In 1948, owing to continuing ill-health, he retired from practice. He is survived by a widow, two sons, and two daughters, two of whom—Major Thomas McKelvey, R.A.M.C., and Dr. Patricia FitzSimmons—are members of the medical profession. The sympathy of his friends and colleagues will be extended to his whole family.

Dr. HARRY CARLILE STURDY died on March 10, after a brief illness, at his home in Bognor Regis, at the age of 73. He was the son of a clergyman and a nephew and godson of Prebendary Wilson Carlile, the founder of the Church Army. A student of Guy's Hospital, he qualified in 1899, graduated M.B., B.S. a year later, and proceeded M.D. in 1903. He was a house-physician at the City of London Chest Hospital and at the East London Children's Hospital before going into general practice in Battersea in 1905, where he remained for over 40 years. He lived at Bolingbroke Grove, Wandsworth Common, until he was bombed out in 1944, and even after that he continued to work and live in Battersea until his retirement in 1946. He was honorary secretary, and at one time chairman, of the Wandsworth Division of the B.M.A., and he was also president for a term of the South-west London Medical Society. He was medical officer at one of the big factories in Battersea, and he was also exceptionally interested in child welfare. He and his wife acted as joint secretaries of the local branch of the N.S.P.C.C. for 30 years, and he continued to take an interest in the affairs of the society while in retirement at Bognor Regis. He is survived by his widow, a married daughter, and a son who is also a member of the profession.

Dr. JANET HADDOW ALLAN FLEMING, whose death on April 1 at the age of 29 was due to smallpox, became infected while attending a postgraduate course in public health at Knightswood Infectious Diseases Hospital. Dr. Fleming, who had not been vaccinated, was present when the original Goanese seaman was being demonstrated as an unusual case of what at that time was thought to be chickenpox. Janet Fleming was educated at Hamilton Academy and took the triple qualification at Glasgow University in 1946. She had acted as an assistant to a Hamilton practitioner and was well known in the town. The sympathy of all who knew her will be extended to her family and to her two brothers, who are also members of the profession.

Medico-Legal

DERMATITIS FROM HAIR DYE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

After a treatment by a hairdresser with "Inecto Rapid" hair dye a lady developed dermatitis and was very ill, temporarily losing nearly all her hair. She sued the hairdresser and Messrs. Rapidol, the manufacturers and suppliers of the dye, for damages. She claimed that the dye was not fit for the purpose for which she bought it; and that the manufacturers, knowing that the dye was a dangerous article which, when applied to the heads of certain persons, might cause acute dermatitis of the scalp, had failed to take any proper steps to ensure that the dye was not applied to the heads of such persons.

The hairdresser denied liability. The manufacturers admitted that they knew that the dye might cause dermatitis in certain persons, but pleaded that they gave the retailer written warnings to that effect on open labels attached to each bottle and to the package containing the bottles, and in the booklet supplied with each package.

Mr. Justice Croom Johnson,[1] trying the case in the High Court, rejected the evidence of the hairdresser that he had known that the dye was dangerous and warned the customer. His Lordship found that the hairdresser had not known that the dye was dangerous and had never warned the plaintiff. The hairdresser was liable to her in contract on the ground that the dye was not fit for the purpose for which she bought it.

On the claim against the manufacturers, the judge said that "Inecto Rapid" hair dye was a highly dangerous and unsuitable material to be applied to this lady's hair. It was put on the market by the manufacturers so that they might make money from women dissatisfied with the beauty with which Nature had endowed them. There were cautions attached to each package containing bottles, and in a booklet, that the preparation might cause serious inflammation of the skin in certain persons and that it should be used only in accordance with expert advice. It was not stated that medical advice should be taken. The booklet suggested a test which the hairdresser might apply, but the medical evidence proved that that test would show only whether a given person would probably suffer from an application of the dye; it did not guarantee that she would not suffer.

If a manufacturer knew that an article which he manufactured was dangerous of itself and did not give an adequate warning to persons into whose hands it might come, he was liable to them for the consequences. In the present case the warning was inefficient and so ambiguous that no reasonable hairdresser would have anticipated what had happened. It might be impossible to give adequate warning of the danger of using such a preparation, but all the difference might have been made if the cautions had stated that the dye was to be used only on medical advice. He gave judgment against the hairdresser and the manufacturers and awarded the plaintiff £600 damages.

[1] *The Times*, February 17, 1950.

Medical Notes in Parliament

N.H.S. SUPERANNUATION REGULATIONS

Lord SHEPHERD, in the House of Lords on March 30, moved the acceptance of the National Health Service (Superannuation) Regulations, 1950, and similar Regulations for Scotland. He said the Regulations were the same except that one provision applied only to Scotland. Medical practitioners in the Highlands and Islands of Scotland received additional payments on retirement. If before retirement they removed from the area where they had practised they were liable, under the 1948 Regulations, to lose these extra payments. It was desirable that men approaching the retiring age should be urged to take lighter duties elsewhere. Under the new Regulations the credit of a medical practitioner would go with him to the new area. This would facilitate the employment of younger medical men for these difficult regions.

Lord Shepherd went on to recall that when the National Health Service was brought into operation persons in the employment of other authorities and entitled to superannuation benefit on retirement were given three months in which they could opt into the national superannuation scheme or, if taken into the scheme, could opt out. A fairly large number remained outside, and the staff side of the Whitley Council had suggested that there should be a fresh period of option. The Regulations before the House provided that persons who had not yet come into the national superannuation scheme could opt into it within a short period. The Minister had decided that he could not provide a reverse option into the schemes in which persons had originally been interested. If a large number left the State scheme the effect would be serious. The request for such a transfer had come from the Royal College of Nursing and not from the Whitley Council.

Lord BURDEN said the option for those who had contracted out would apply to approximately 46,000 men and women. An option for those now in the scheme to contract out would involve 140,000 men and women.

Lord WEBB-JOHNSON said that it was important that administrative matters such as this should be dealt with by the Whitley Council and not by outside bodies after a decision had been reached.

Lord SHEPHERD undertook, if the Regulations were passed that day, to have an investigation of the complaints that hardship was being caused to those who had insufficient opportunity to exercise the original option.

The Regulations were then agreed to.

Employer's Contribution for Assistants

On the same date the House of Commons considered the same Regulations. Mr. BLENKINSOP said it was proposed to drop the arrangement whereby the wife's potential pension as a widow grew less as the man's age increased. He explained the proposal to give a further option of entry into the superannuation scheme for those who had originally decided to stay outside the scheme. Regulation 46 was now amended to exempt the general practitioner who employed an assistant from liability for the employer's contribution for that assistant. This would throw some extra charge on the Exchequer, but was felt to be a reasonable adjustment.

Mr. WALTER ELLIOT said it would be advantageous for a person's superannuation rights to be carried round as a snail carries its shell. He hoped Mr. Bevan would consider again whether the books could not be temporarily reopened for outward movements from the national superannuation scheme. It had been suggested that as many as 10,000 people would prefer

the federated scheme. The Regulations were long and complicated, but they had been subjected to considerable examination by the professional bodies concerned, and on the whole they reported agreement.

Mr. LINSTEAD said that the Regulations were difficult to understand. It was a tribute to the Minister and his advisers that they had been able to make a coherent scheme out of a jigsaw puzzle of old provisions. He believed there was strength in the claim that some of those who had entered the scheme in October, 1948, might wish to have second thoughts. At a hospital with which he was associated, he found only three or four days before the last date for contracting out that the whole staff was in confusion about the meaning of the Regulations. A member of the superannuation section of the Ministry of Health came to the hospital to explain the scheme to the staff, was caught out on his own Regulations, and had to write some days afterwards to explain what the situation really was.

Dr. CHARLES HILL said the Regulations achieved a high standard of intelligibility, and he gave a general welcome to them, congratulating the Minister and his advisers on what had been done. The Parliamentary Secretary to the Ministry had mentioned that any practitioner contemplating marriage would no longer have to engage in complicated mathematics to see what effect the margin of age between the practitioner and his bride would have on the widow's pension. Further, the Minister had removed an anomaly, and a widow who was herself a practitioner would no longer be prevented from enjoying the widow's pension as well as the pension she herself had earned. He reinforced the plea put forward for further consideration by the Minister of the two-way option. In the first Draft there had been 88 pages of Regulations governing superannuation, and within three months certain groups, mainly nurses and members of some societies and physiotherapists, had to decide for themselves whether it was to their advantage to pass automatically into the new superannuation scheme or to take the step of opting out. Human inertia played a part in the situation, and the individual found himself or herself inside the scheme without appreciating the effect of the decision. He suggested it would be wise and fair on an early occasion to meet this two-way point, despite the admitted difficulties.

The Parliamentary Secretary had pointed out that this was the fourth document dealing with superannuation. All four sets of Regulations had been submitted to the House to affirm, or not to affirm. It had been practically impossible for the House to make certain of any changes it desired to make. The choice before the House that night was to affirm, or not to affirm, the whole document embodying the consolidation and change of some 28 Regulations. He suggested to the Minister that, now the fluid stage was over, superannuation should be dealt with by dissecting out the principles from the details, and by embodying the principles in a Bill so that they could be discussed on the floor of the House and in committee in detail. The Minister would then give the House an opportunity of submitting the various parts of the scheme to full scrutiny, which would lead to a more satisfactory position.

The Minister was to be congratulated on the general result of his revision of the Regulations, but Dr. Hill hoped he would not desire the House to take too seriously the hint he had given that they were approaching finality in this matter. The Minister should be ready, as new problems and new angles to old problems came to him, either through the Whitley machinery or by direct representation, to put forward draft Regulations, bearing in mind the difficulty which confronted the House when it had to say Yea or Nay to a large and complicated document.

Dr. H. B. MORGAN congratulated the Minister, and hoped that he would not accept the two points made by Dr. Hill. He denied that those who now wished to get out of the Scheme were in their present position as a result of human inertia. They had known what they were doing when they had not made an application within three months to be left out.

Dr. HILL said it was inertia when, by doing nothing, a person drifted into the new scheme without asking whether it had advantages over the scheme which covered one at the moment.

Dr. MORGAN replied that persons quite deliberately, after consideration, within three months had put in an application saying that they did not want to go into the new scheme, but preferred to remain in the old scheme. He remarked that in course of his medical duties he attended to more cases of superannuation than any other professional member in the House. He was on the executive of a Trade Union. He wished to say how much he and those concerned on the Whitley Council who had fought for the superannuation scheme congratulated the department on bringing it forward. He hoped the Minister would stick to the principle of the one-way option, because it was the best point of the whole scheme.

Mr. BLENKINSOP, replying to the debate, said the Ministry was grateful for the atmosphere in which the Regulation had been received. He expressed gratitude to the staff which had been concerned with these complex problems. The Ministry and the officers of the federated scheme had done their utmost to make the terms of the two schemes understood by the staffs of the hospitals and by the other staffs concerned. Persons on the staff side of the Whitley Council, representing some of the organizations which recently made representations on this matter to Members on both sides of the House, must have had full information on these proposals.

The one-way option would apply to 46,000 people, which was a real administrative strain. The Ministry felt, however, that the long-term advantages of the scheme were such that it was worth taking that strain now. Were the option to be made a two-way one, this would mean having to open an option to some 140,000 persons. Considering administrative problems, the question of staff, finance, and the rest, this would be impracticable. Mr. Blenkinsop appreciated that there must be individual cases of hardship, but he remarked that Mr. Bevan had already found ways of dealing with certain individual cases which had been brought to his notice. He would be willing to adopt a similar attitude to other individual cases of hardship. He hoped that, with that assurance, Members would approve the Regulations.

The Draft National Health Service (Superannuation) Regulations, 1950, were then approved without a division, as were the similar Regulations for Scotland.

Midwives Bill

The House of Lords, also on March 30, went into Committee on the Midwives (Amendment) Bill. Drafting amendments were made in Clause 5 on the certification in England and Scotland of midwives trained outside the United Kingdom. On Clause 6, which is concerned with midwives' uniforms, an amendment was inserted on the motion of Lord WEBB-JOHNSON, running, "Which they shall have the right to wear should they so desire." This would allow midwives to continue to wear a national rather than a local-authority uniform if they so wished. An amendment was made to Clause 8 to enable loss of earnings to be met, together with any other additions to normal travelling and other expenses for members of the Central Midwives Board. Minor amendments were made in the schedules, and the Committee stage ended.

Mr. ISAACS reports that there are 74 unemployed medical practitioners on the Appointments Register. This number includes 36 foreign doctors, most of whom are Polish. In common with other registrants at Appointments Offices these men and women are submitted for any suitable vacancies notified to the Ministry of Labour.

The position of hospitals in relation to the Control of Building Operations (No. 14) Order, 1949, which came into force on February 1, is defined in a memorandum which the Minister of Health has sent to hospital boards and committees. No change is made in the present limit of £1,000 for capital work which can be carried out by boards without the Minister's prior authorization. Where the cost of the proposal is £1,000 or more, the Department will require to be notified of the estimated labour force required for the job when details of the provisionally accepted tender are sent. The memorandum also emphasizes the importance of hospitals cutting their expenditure on maintenance work "to an irreducible minimum."

Universities and Colleges

UNIVERSITY OF ABERDEEN

At a medical graduation ceremony on March 29 the following degrees were conferred:

D.Sc.—G. A. G. Mitchell, M.B., Ch.B.

M.D.—*K. B. Fraser.

M.B., CH.B.—T. P. G. Allison, Miriam Blank (*née* Bennett), J. Breeze, J. M. Craig, Eileen Davis, G. B. Farquharson, J. Geddes, J. L. Hardie, D. McNicol, T. F. P. Pimley, M. R. Pinnock, D. Ross, P. M. Sammon, J. W. T. Shepherd, A. J. Tulloch, M. J. A. Watson.

*With honours.

UNIVERSITY OF MANCHESTER

The following appointments are announced: *Lecturers in Anatomy*, G. T. Ashley, M.B., Ch.B., and Roger Warwick, M.B., Ch.B. *Lecturer in Medicine*, M. D. Milne, M.B., Ch.B. *Lecturer in Medical Neurology*, L. A. Liversedge, M.D., M.R.C.P. *Assistant Lecturer in Ophthalmic Pathology*, J. L. S. Smith, M.B., B.Chir., D.O.M.S. *Medical Officer for Women Students in the Department of Education*, Eleanor B. Schill, M.B., Ch.B., D.P.M.

The following candidates have been approved at the examination indicated:

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—*Part I:* Zygmunt Finkelstein, J. T. Leyberg, Susanne Shafar.

UNIVERSITY OF BIRMINGHAM

Professor A. C. Frazer, Professor of Pharmacology in the University, who has been appointed to a guest lectureship by the United Universities of Sweden for the session 1949–50, delivered lectures in Stockholm, Uppsala, and Lund between March 3 and 17. Professor Frazer will also lecture at a number of American universities during April and May.

At the annual meeting of the Court of Governors of the University, held on February 23, W. H. Wynn, M.D., F.R.C.P., Emeritus Professor of Medicine in the University, was elected a Life Member of the Court, and Dr. H. W. Donovan and Dr. J. L. Stafford were elected Members. The title of Emeritus Professor of Pathology was conferred on Professor G. Haswell Wilson, M.D.

The *University of Birmingham Gazette* dated March 10 (Vol. 2, No. 5) contains revised regulations for the degrees of M.D. and Ch.M.

Dr. C. G. Teall has been appointed representative of the University at the International Congress of Radiology to be held in London in July.

A. J. H. Rains, F.R.C.S., has been appointed Lecturer in Surgery and J. M. French, Ph.D., M.B., B.S., has been made an honorary member of the staff of the Department of Pharmacology.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

FINAL M.B., CH.B.—*Part II:* T. D. M. Adams, I. Berman, Jean D. Birtles, P. J. Boultbee, G. E. Burrows, Marie D. Carroll, *H. D. Cheetham, Sheila M. Cochrane, T. J. Dailey, F. J. Deakin, Jeanette Diamond, Cynthia J. Discombe, Pamela Elliot, D. A. P. Evans, K. M. Fraser, M. Goldman, J. H. Green, Beryl L. Greenwood, K. C. Greenwood, B. G. Haggart, R. A. Hardman, J. C. Hinchliffe, J. A. Howe, F. R. Howell, D. O. Hughes, J. S. Jones, K. V. Jones, C. G. Lambert, R. Larkin, M. M. J. Lavoipierre, Roma McDonald, W. M. MacKean, Heather G. Mathews, J. B. Newton, J. V. Occleshaw, E. Patrick, Marianne A. A. Phillips, I. M. Quest, Esther M. E. Ramsay, M. A. H. Rayman, J. G. Rigby, Megan Roberts, J. B. Rogers, Patricia M. Russell, J. A. Seddon, F. Seymour, L. Sheargold, R. Smyth, W. J. Stanley, J. G. K. Thomas, E. I. Waldman, K. Walley, K. Warburton, R. Wharton, R. M. Whelan, Ellen G. Williams, T. D. Williams, R. G. B. Willis, M. C. Winter, Mary M. Yewdall.

DEGREE OF M.RAD. AND DIPLOMA IN RADIOLOGY.—*Part I:* J. H. E. Carmichael, F. M. Hall, P. Haslam, D. T. Irwin, G. Jarratt, A. C. Kurowski, A. G. McCarey, O. N. Saxena, D. R. Wallace-Jones.

*With distinction.

UNIVERSITY OF LEEDS

At a meeting of the Council of the University held on March 15 F. W. Spiers, Ph.D., B.Sc., was appointed to the newly instituted Chair of Medical Physics, from a date to be arranged. Dr. Spiers was a demonstrator in the Department of Physics from 1931 to 1935, when he was appointed to his present post of physicist to the Radiotherapy Centre of the General Infirmary at Leeds. Since 1943 he has also been Lecturer in Medical Physics in the University.

Other appointments were made as follows: Mrs. Georgiana May Bonser, M.D., M.R.C.P., as Reader in Cancer Research, and L. L. Dmochowski, M.D., as Reader in Cancer Research, both from October 1.

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council held on March 17, with Dr. Edward Bramley, Pro-chancellor, in the chair, S. E. Dicker, M.D., Ph.D., D.Sc., was appointed Lecturer in Physiology.

The following candidates have been approved at the examinations indicated:

M.D.—H. J. Whiteley.

M.B., CH.B.—*J. D. S. Hammond, E. A. Badoe, Stella M. Benson-Cooke, E. R. Bowler, Lorna Chippindale, Sheila R. S. Cooper, C. K. Crawford, G. Dalton, Margaret R. Davies-Jones, Dora C. Dean, M. W. L. Dibb, J. A. Greenwood, B. Hirst, P. A. Isherwood, Katherine B. Laird, A. J. Moore, Barbara Moore, Moreen C. O'Brien, S. S. Scott, Y. J. F. Sojka, C. R. Thickett, W. D. Turner, Audrey J. Warren.

*With first-class honours.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

A course of lectures in general medicine will be given at the College (Pall Mall East, London, S.W.) on various dates between May 1 and June 19, at 5 p.m. each day. The inclusive fee for the course is £7 7s. and the total entry is limited to 200. Fees are payable in advance and must be received at the College by April 24.

SOCIETY OF APOTHECARIES OF LONDON

Mr. Duncan Fitzwilliams, Master, presided at a meeting of the Court of Assistants on March 28.

The following were appointed as representatives of the Society: Dr. J. Prescott Hedley, on the Central Midwives Board; Dr. Frank Howitt, on the Board of Registration of Medical Auxiliaries, in succession to Mr. L. Vernon Cargill, who has resigned; and Mr. J. F. Carter Braine, at the 6th International Congress of Radiology.

It was reported that the Minister of Town and Country Planning had included the Society's property in the final list of buildings of special architectural or historic interest.

It was announced that arrangements had been made with the Wellcome Trust for the editing and publication of the history of the Society by the late Dr. Cecil Wall, archivist.

Books and documents were received from the Master, Mr. Philip Gibbons, and the Librarian of the Royal College of Physicians.

It was resolved to hold a course of ten postgraduate lectures from December 4 to 8 on Modern Methods of Diagnosis and Treatment.

The following were granted the Diploma in Industrial Health upon examination: M. M. Abdel-Latif, D. E. Barton, R. E. W. Fisher, E. A. W. Marien, R. Murray, G. H. G. Southwell-Sander, J. Watkins-Pitchford.

The Diploma of L.M.S.S.A. was granted upon examination to the following successful candidates: M. A. Abraham, S. N. Shenai, M. E. M. Grasse, J. C. Anderson, L. I. Norman, D. H. Le Clus, A. C. De Beer-Eksteen, C. R. Lynn.

The Services

Major-General Thomas Young, O.B.E., late R.A.M.C., has been appointed Honorary Physician to the King in succession to Lieutenant-General Sir Neil Cantlie, K.B.E., C.B., M.C., K.H.S., late R.A.M.C.

Brigadier (Temporary Major-General) F. R. H. Mollan, C.B., O.B.E., M.C., late R.A.M.C., has been appointed Honorary Surgeon to the King in succession to Colonel David Fettes, C.B.E., late R.A.M.C., retired and re-employed.

Flight Lieutenant W. B. Kennedy, R.A.F., has received the King's Commendation for brave conduct at Seletar on November 20, 1949.

NAVAL MEDICAL COMPASSIONATE FUND

A meeting of the subscribers of the Naval Medical Compassionate Fund will be held at the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W., on Friday, April 21, at 2.30 p.m., to elect six directors of the fund.

TERRITORIAL ARMY MEDICAL OFFICERS' ASSOCIATION

A meeting of the Territorial Army Medical Officers' Association will be held at the Lecture Theatre, Millbank, London, S.W., on Saturday, May 20, at 2.30 p.m.

No. 12

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 25.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	52	2	18	2	2	57	5	15	1	1
Deaths		—	—				—	—		
Diphtheria	76	9	25	—	—	114	9	28	3	1
Deaths	—	—	—	—	—	—	—	1	—	—
Dysentery	427	19	69	2	—	35	4	13	—	—
Deaths					—					
Encephalitis, acute	5	—	—	1	—	—	—	—	—	—
Deaths		—		—			—			
Erysipelas			22	8	2			29	13	5
Deaths										
Infective enteritis or diarrhoea under 2 years				11					18	
Deaths	16		3	2	—	37	4	6	4	3
Measles*	5,716	98	329	95	404	16,275	1231	292	118	168
Deaths†			1	—	—			—	—	1
Ophthalmia neonatorum	37	5	12	1	—	56	4	15		—
Deaths										
Paratyphoid fever	1	1	—		—	2	—	—		—
Deaths	—		—		—	—		—		—
Pneumonia, influenzal	1,082	53	13		24	1,524	66	23	20	9
Deaths (from influenza)‡	135	15	4	9	6	360	31	6	3	6
Pneumonia, primary			191	¶				247		
Deaths	341	56		18	11	488	71		10	21
Poliomyelitis, acute	29	3	—	2	1	18	—	1	1	—
Deaths§	3	—		—		1	—			
Puerperal fever		—	13				—	13		
Deaths										
Puerperal pyrexia‖	116	13	8	—	1	104	8	5	2	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,805	112	222	64	115	1,209	63	179	138	44
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	4	1	1	1	—	3	—	—	3	—
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough*	2,362	93	398	71	51	2,790	221	272	57	62
Deaths	8	—	—	2	1	15	1	2	5	2
Deaths (0–1 year)	243	28	40	27	15	333	40	42	36	14
Deaths (excluding stillbirths)	5,810	926	640	276	155	7,429	1094	744	230	195
Annual death rate (per 1,000 persons living)			12·9					14·9	14·3	
Live births	8,177	1261	976	444	234	8,103	1256	967	339	260
Annual rate per 1,000 persons living			19·6					19·4	21·0	
Stillbirths	183	30	29			202	23	27		
Rate per 1,000 total births (including stillborn)			29					27		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Smallpox in Glasgow

Up to April 11 there had been six deaths in the outbreak of smallpox in Glasgow. The earlier stages of this outbreak have already been described fully (April 1, p. 795; April 8, p. 853), but more details are now known about the original case.

This Asian seaman, aged 38, was admitted to Knightswood Hospital, Glasgow, on March 10 as a case of pneumonia. On March 13 he was transferred to a cubicle as a probable case of chicken-pox. He had previously been well vaccinated. On March 23 he was quite well and he was discharged to the Indian seamen's hostel. His ship, the *Chitral*, had been given a clean bill of health, and the appearance of cases of smallpox on March 25 among the nursing staff at Knightswood Hospital was the first indication of the true nature of his illness—namely, much modified smallpox.

Altogether there have been 20 secondary cases, with six deaths. One death was due to haemorrhagic smallpox, four were cases of confluent smallpox, and the sixth fatal case was a baby aged 10 months. This infant was suffering from toxoplasmosis and had been nursed in the same ward as the original case. Among the part-time and full-time nurses in contact with the original patient there have been eight cases of smallpox, with three deaths. Another of the fatal cases was in a laundry-maid who handled the bedclothes from the primary case. Most of the fatal cases have been in women who were not vaccinated or who had an unsatisfactory history of vaccination.

The outbreak so far has been entirely confined to direct contacts with this Asian seaman, and according to officials of the public health department if no further cases arise from contact with the 20 secondary cases Glasgow will be regarded as clear of smallpox by April 17.

Approximately 300,000 persons have now been vaccinated, 170,000 of them by the public health department's own clinics.

Discussion of Table

In *England and Wales* there were increases in the notifications of measles 139, whooping-cough 131, dysentery 29, and diphtheria 14, while a decrease was reported in the incidence of scarlet fever 32.

The largest rises in the notifications of measles were Leicestershire 100, Cheshire 65, Durham 62, Lincolnshire 62, Kent 47, London 44, and Surrey 43; the largest decreases were Lancashire 82, Norfolk 69, Suffolk 65, Staffordshire 64, and Yorkshire North Riding 53. There were only small variations in the local incidence of scarlet fever.

The chief changes in the notifications of diphtheria were rises of 5 in Lancashire and Devonshire (4 cases in Bideford M.B.) and of 4 in London. There were increases in the notifications of whooping-cough in Warwickshire 65, Surrey 49, and Staffordshire 43.

The chief centres of dysentery were Yorkshire West Riding 150 (Sheffield C.B. 66, Leeds C.B. 42, Bradford C.B. 19); Durham 114 (Blaydon U.D. 40, South Shields C.B. 26, Stanley U.D. 22, Sunderland C.B. 10); Lancashire 39 (Darwen M.B. 10, Manchester C.B. 7); Yorkshire North Riding 24 (Middlesbrough C.B. 23); Northumberland 21 (Newcastle-upon-Tyne C.B. 16); London 19 (Islington 6).

In *Scotland* there were increases in the incidence of measles 52 and scarlet fever 51, while the notifications of acute primary pneumonia decreased by 36. The increase in the incidence of scarlet fever was mainly contributed by Ayr county, where the cases rose from 3 to 33. The chief feature of the returns of diphtheria was a rise of 5 in Glasgow. The largest returns for dysentery were Glasgow 36 and Dundee 16.

In *Eire* there were decreases in the incidence of measles 52 and scarlet fever 14, while a rise of 25 was reported in the notifications of whooping-cough. An outbreak of measles with 31 notifications occurred in Waterford, Kilmacthomas R.D.

In *Northern Ireland* an increase of 40 in the notifications of measles was the only variation in the trends of infectious diseases; the largest rise was Antrim county 23.

Week Ending April 1

Notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,749, whooping-cough 2,488, diphtheria 67, measles 6,307, acute pneumonia 941, acute poliomyelitis 20, dysentery 461, typhoid fever 1. In the great towns 121 deaths were attributed to influenza.

Medical News

The Faculty of Anaesthetists

The second anniversary dinner of the Faculty of Anaesthetists of the Royal College of Surgeons was held at the College on March 29. The dean of the Faculty, Mr. A. D. Marston, who presided, said that one of the chief functions of the faculty was the encouragement of postgraduate education, and anaesthetists viewed with great satisfaction the increasing liaison between the Royal College and the British Medical Postgraduate Federation. Sir Cecil Wakeley, president of the Royal College, referred to the great strides which had been made in anaesthetics during the past 10 or 20 years. The future of surgery was bound up with progress in anaesthesia, and with it the great problem of analgesia in childbirth. Sir Harry Platt, in proposing the toast of the Faculty, referred to the need for restoring general practice to its former prestige and especially for integrating it with the hospital service. While major obstetrics must be the field of the specialist, minor obstetrics should be the province of the general practitioner, but the problem was the borderline between major and minor. He knew that he was on delicate ground in suggesting that in the anaesthetic service the general-practitioner anaesthetist had a part to play. The Faculty would be called upon to determine the basic training—a decision calling for great wisdom, which such a specialist faculty within the Royal College was likely to possess. Dr. Bernard R. M. Johnson, vice-dean, said that the Faculty was probably the strongest link between medicine and surgery existing at present. The standard of British anaesthesia was head and shoulders above that to be found in the whole of Europe, and it must be safeguarded most carefully. He hoped that the State in the medical field would continue to seek the advice of the learned medical bodies so as to ensure that no step was forced upon them by administrative demand which would have the effect of lowering the standard. Dr. John Gillies proposed the health of the guests, and Professor Lillian Penson, vice-chancellor of the University of London, and Sir John Charles, Deputy Chief Medical Officer, Ministry of Health, responded.

Coroners' Inquests in London

During 1949 the number of deaths reported to coroners in the county of London was 10,217; inquests were held in 2,089 cases, and inquiries without inquests in 8,128. The number of cases of suicide was 462; 152 of them were of persons over 60 years of age. Post-mortem examinations were directed by the coroners to be made in 2,047 of the 2,089 inquest cases, and in 7,131 of the cases investigated without inquest. Verdicts of murder were returned in 15 cases, compared with 8 the year before, and 6 inquests were held after executions. The number of people who met their deaths by accident was 1,113. Deaths caused by want of attention at birth numbered 14, and there were 22 inquests on newborn children. The total cost of the service, including coroners' salaries and allowances, was £47,483.

Dangerous Drugs Regulations

Under the Dangerous Drugs Regulations, 1950, which came into operation on April 1, midwives are authorized to possess and administer pethidine. The regulations remove the following preparations from the list of drugs exempted from the principal regulations: Linctus diamorphinae camphoratus, *B.P.C.* 1923 and 1934; linctus diamorphinae c. ipecacuanha, *B.P.C.* 1934; linctus diamorphinae et scillae, *B.P.C.* 1923 and 1934; and linctus diamorphinae et thymi, *B.P.C.* 1923 and 1934. They also consolidate the provisions as to the classes of persons authorized to possess and supply drugs, and in relation to hospitals restrict the class of persons employed as dispensers who are not registered pharmacists, while adding in special circumstances sisters in charge of wards or out-patient departments.

British Association of Physical Medicine

At a meeting of the council of the British Association of Physical Medicine held on March 21 it was announced that Mr. Bernard Baruch, of New York, has presented the association with a donation of £1,000 to be used as its president, Lord Horder, might suggest.

Index to Soviet Periodicals

An "English Index to Soviet Medical Periodicals Available in London Libraries" has been prepared by Mr. Donovan T. Richnell, Deputy Librarian at London University, on behalf of the Medical Committee of the Society for Cultural Relations with the U.S.S.R. Volume 1, which has been published by Messrs. H. K. Lewis (20s.), covers the years 1945–7. Subjects and authors are indexed with cross-references, and the libraries where the journals may be seen are listed. The Russian alphabet is transliterated into the Roman, and the titles and subjects are translated into English.

Maternal Health Committee

The Maternal Health Committee has decided to close down, since other bodies are now continuing its work. It was founded in 1927 as the Maternal Mortality Committee to consider how, by the dissemination of information and by administrative measures, maternal mortality might be reduced. At a meeting on October 27 of that year Sir George Newman, who was Chief Medical Officer of the Ministry of Health, gave the principal address. He emphasized that it was necessary to create a public opinion which would lead the pregnant woman to consult her doctor in a simple and natural way at the earliest juncture. A second need was for maternity homes, and a third for skilled and competent assistants at childbirth. A resolution was passed urging improved midwifery training for medical students and midwives, better provisions for maternity under the N.H.I. Act, and extension of the work of local authorities in providing clinics, welfare centres, and health visitors.

Royal College Appeals

The Royal College of Obstetricians and Gynaecologists has opened an appeal for £400,000. The College proposes to devote £200,000 to building, £150,000 to research and general funds, and £50,000 to establishing a Commonwealth travelling professorship. The College has outgrown its present house at 58, Queen Anne Street, London, W.1, and the library and museum must be expanded. Contributions will be gratefully received, and should be sent to the treasurer of the College.

Film on Taking Blood

The film *Taking Blood*, made by Kinecrat with the co-operation of Bayer Products and the Clinical Research Association, is intended to instruct nurses, students, and general practitioners in the technique of venepuncture and the details of efficient collection of blood samples. The information is given by a dialogue between a layman, a pathologist, and a director of laboratory research. The film sketches the history of bloodletting and phlebotomy by showing antique instruments once used for this purpose. Modern methods of venepuncture, which sprang from the introduction of Alexander Wood's syringe and hollow needle, are illustrated by the use of the Wassermann needle, the customary types of glass syringe, and the more recent "venule." This is a vacuum cylinder with an intravenous needle attached, which is intended for the collection of single blood samples. The methods of venepuncture with syringe and venule are demonstrated clearly on patients. The film should be a valuable piece of instruction in this common yet sometimes remarkably difficult simple procedure, though skill with the intravenous needle can be acquired only by sufficient practice. More emphasis might have been laid on the care with which syringes must be sterilized between cases, for the spread of infection is the most serious disadvantage of this omnipresent piece of medical equipment.

COMING EVENTS

Psychiatric Congress in Ireland

A conference on mental health will be held at the Hospital of St. John of God, Stillorgan, near Dublin, on April 17–19. Speakers include Dr. Alfred Torrie, Dr. L. T. Hilliard, and Professor T. S. Symie, professor of social science at Liverpool University.

Microscopy

The Royal Microscopical Society and the Electron Microscopy Group of the Institute of Physics will hold an International Convention of Modern Microscopy on April 18–21 at King's College Medical School, Newcastle-upon-Tyne. Full particulars may be obtained from the assistant secretary, Royal Microscopical Society, B.M.A. House, Tavistock Square, London, W.C.1.

Social Service

The National Council of Social Service will hold a Conference on Social Work at Harrogate on April 19–23. The main theme of the conference is "Social Services in 1950: The Respective Roles of Statutory Authorities and Voluntary Organizations." The conclusions of the conference will be presented at the International Conference on Social Work to be held in Paris on July 23–28.

Osler Club

The next meeting of the Osler Club will be held on Friday, April 21, at the Medical Society of London, 11, Chandos Street, at 8 p.m. The subject will be William Welch, his life and works, and among the speakers will be Dr. J. Burn, M.O.H. for Salford, who will speak of Welch's work in public health and epidemiology, and Dr. John Cotes, who will contribute a description of Welch's life.

British Orthopaedic Association

The Spring Meeting of the British Orthopaedic Association will be held at Cardiff on April 21–22 under the presidency of Mr. S. L. Higgs.

National Marriage Guidance Council

The Annual Conference of the National Marriage Guidance Council will be held on May 6–13 at the Lido, Rustington, near Littlehampton. Full particulars may be obtained from the council at 78, Duke Street, Grosvenor Square, London, W.1.

SOCIETIES AND LECTURES

Monday

HUNTERIAN SOCIETY.—At Talbot Restaurant, 64, London Wall, E.C., April 17, 7 for 7.30 p.m., annual general dinner-meeting, followed by demonstration of hypnotism by Mr. Peter Casson.

LONDON COUNTY MEDICAL SOCIETY.—At St. Nicholas's Hospital, Tewson Road, Plumstead, S.E., April 17, 3 p.m., clinical meeting.

MAIDA VALE HOSPITAL, Maida Vale, London, W.—April 17, 4.30 p.m., commencement of spring session. Opening address by Dr. Russell Brain.

ROYAL EYE HOSPITAL (KING'S COLLEGE HOSPITAL GROUP), St. George's Circus, London, S.E.—April 17, 5.30 p.m., "*Ophthalmic Signs and Symptoms in Intracranial Aneurysms*," by Dr. T. Rowland Hill.

Tuesday

EDINBURGH UNIVERSITY.—At Physiology Lecture Theatre, University New Buildings, Teviot Place, April 18, 5 p.m., "*The Science of Retrospection*," by Dr. Douglas Guthrie.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—April 18, 5.30 p.m., "*Glaucoma*," by Sir Stewart Duke-Elder.

ROYAL EYE HOSPITAL (KING'S COLLEGE HOSPITAL GROUP), St. George's Circus, London, S.E.—April 18, 5 p.m., "*Science and Art of Refraction*," by Dr. T. H. Whittington.

SOCIETY FOR THE STUDY OF ADDICTION.—At Medical Society of London, 11, Chandos Street, Cavendish Square, London, W., April 18, 4 p.m., "*Modern Techniques for the Treatment of Acute and Prolonged Alcoholism*," by Dr. A. Spencer Paterson. A discussion will follow.

Wednesday

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—April 19, 5.30 p.m., "*Possibilities of Treatment of Genetic Eye Disease*," by Dr. K. Tansley.

ROYAL EYE HOSPITAL (KING'S COLLEGE HOSPITAL GROUP), St. George's Circus, London, S.E.—April 19, 5 p.m., "*Some Recent Advances*," by Mr. B. W. Rycroft.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—April 19, 3.30 p.m., "*The Pioneer Health Centre*," by Dr. G. Scott Williamson.

Thursday

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, London, W.—April 20, 8.15 p.m., "*Experiences in the Clinical and Radiological Investigation of Salivary Gland Infections*," to be opened by Dr. R. G. W. Ollerenshaw and Mr. S. S. Rose.

HONYMAN GILLESPIE LECTURES.—At Anatomy Theatre, University New Buildings, Teviot Place, Edinburgh, April 20, 5 p.m., "*The Physiological and Clinical Effects of the Pituitary Adrenocorticotrophic Hormone and the Adrenal Cortical Hormones*," by Professor L. S. P. Davidson.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—April 20, 5.30 p.m., "*Scleritis*," by Mr. A. B. Nutt.

ROYAL EYE HOSPITAL (KING'S COLLEGE HOSPITAL GROUP), St. George's Circus, London, S.E.—April 20, 5 p.m., "*Affections of the Fundus*," by Professor Arnold Sorsby.

ROYAL PHOTOGRAPHIC SOCIETY: MEDICAL GROUP.—At 16, Princes Gate, London, S.W., April 20, 7 p.m., "*Dental Microscopy and its Photography*," by Mr. E. B. Brain, F.R.P.S.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—At B.M.A. House, Tavistock Square, London, W.C., April 20, 5.30 p.m., Discussion: "*Salmonella Infections in Humans and Animals*," to be opened by Dr. Joan Taylor.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—April 20, 4.30 p.m., "*Psychiatry*," lecture-demonstration by Dr. D. Curran.

Friday

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons, Lincoln's Inn Fields, London, W.C., April 21, 2.15 p.m., Diagnosis Section meeting. Papers: "*Chest X-rays in Infectious Diseases*," by Dr. J. C. H. Mackenzie; "*Venography in Varicose and Postphlebitic Ulceration*," by Dr. J. D. Dow; "*Nephrocalcinosis*," by Dr. E. Hanson.

RESEARCH DEFENCE SOCIETY.—At Medical Society of London, 11, Chandos Street, Cavendish Square, London, W., April 21, 5.30 p.m., "*The Production and Care of Laboratory Animal Stocks*," by Mr. A. L. Bacharach, M.A., F.R.I.C.

ROYAL EYE HOSPITAL (KING'S COLLEGE HOSPITAL GROUP), St. George's Circus, London, S.E.—April 21, 4.30 p.m., "*Medical Ophthalmology*," by Mr. A. J. Cameron.

SOCIETY OF CHEMICAL INDUSTRY: FINE CHEMICALS GROUP.—At Large Anatomy Lecture Theatre, King's College, Strand, London, W.C., April 21, 7 p.m., annual general meeting; 7.30 p.m., "*The Chemistry of Trypanocides*," by Dr. L. P. Walls. Discussion to be opened by Dr. E. M. Lourie.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Hammersmith Hospital, Ducane Road, London, W., April 21, 8 p.m., clinical evening.

APPOINTMENTS

KING'S COLLEGE HOSPITAL, Denmark Hill, London, S.E.—*Assistant Surgeon*, A. J. Heriot, M.S., F.R.C.S.; *Assistant Physician*, S. Oram, M.D., M.R.C.P.; *Physician to the Department of Psychological Medicine*, J. D. N. Hill, M.B., M.R.C.P., D.P.M.; *First Assistant to the Children's Department*, M. J. Wilmers, M.D., M.R.C.P.; *Assistant Physician in the Dermatological Department*, D. I. Williams, M.B., B.S., M.R.C.P.; *Assistant Thoracic Surgeon*, W. P. Cleland, M.S., F.R.C.S., M.R.C.P.; *Assistant Surgeon to the Urological Department*, M. A. Harland Rees, B.M., B.Ch., F.R.C.S.; *Assistant Anaesthetist*, S. A. Mason, M.B., B.S., D.A *Plastic Surgeon*, F. T. Moore, O.B.E., F.R.C.S., M.R.C.P.; *Director of the Department of Diagnostic Radiology*, J. Blewett, M.D., F.F.R.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Leaming.—On March 23, 1950, to Barbara, wife of Dr. H. Leslie Leaming, a son—Ian Peter.

Morris.—On March 29, 1950, in London, the wife of Dr. David Morris, a son.

Oakes.—On March 23, 1950, to Vera, wife of Dr. R. L. Oakes, Kernick House St. Stephen, St. Austell, Cornwall, a son.

Wilkinson.—On March 20, 1950, at Queen Elizabeth Hospital, Birmingham, to June (née Tolley), wife of Dr. Ian L. Wilkinson, a son—Simon David.

DEATHS

Bradford.—On April 3, 1950, at Sea Breeze, West Bay Road, Bridport, Dorset, John Bradford, M.B., B.Ch.

Bryce.—On March 27, 1950, at Kitale, Kenya Colony, Macgregor Kirk Bryce, L.M.S.S.A., Colonel, I.A.M.C.

Francis.—On February 3, 1950, at Georgetown, Demerara, British Guiana, Oliver Michael Francis, M.D., D.P.H., aged 64.

Grant.—On March 24, 1950, at Cerrig-y-Druidion, Corwen, North Wales, Lewis Grant, M.D., late of Neston, Cheshire.

Pellatt.—On March 30, 1950, at District Hospital, Tunbridge Wells, Edith Bertha Pellatt, L.S.A., of St. John's, Crowborough, Sussex.

Riley.—On April 3, 1950, at Seapoint, West Cliff Road, Broadstairs, Ronald Riley, M.R.C.S., L.R.C.P.

Savage.—On March 30, 1950, Herbert Nibbs Savage, M.R.C.S., L.R.C.P., J.P., of 34, Barrow Bridge Road, Bolton, Lancs, aged 53.

Taylor.—On March 30, 1950, at Kirkhill, Coldingham, Berwicks, George Taylor, M.D., D.P.H., late of Leicester.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Respiratory Diseases caused by Viruses

Q.—*Can you give me any information about the diagnosis of the respiratory diseases caused by viruses?*

A.—The respiratory diseases of known virus aetiology are influenza and certain forms of non-bacterial pneumonia—for example, primary atypical pneumonia, psittacosis or ornithosis, and, if rickettsial infection be included in this general definition, Q fever. The diagnosis of virus influenza may be made by isolation of the virus from garglings taken in the first few days of infection and inoculated into ferrets or chick embryos. The development of specific antibodies to influenza viruses A and B can be demonstrated by a complement-fixation test or by the Hirst haemagglutination reaction. Specimens of serum should be obtained in the first few days of infection and again at the tenth to the fourteenth day, in order to demonstrate a possible rise in the titre of antibodies.

Primary atypical pneumonia, characterized by fever, headache, and non-productive cough, is recognized by the typical radiological appearances and, in the more severe cases, by the development during the second week of infection of cold agglutinins to a suspension of red blood cells. A titre of 1:32 upwards is usually diagnostic. Psittacosis may be diagnosed by isolation of the virus from serum or blood after inoculation into mouse or chick embryo. The development of antibodies may also be demonstrated by complement-fixation test; the Frei skin test, used primarily in lymphogranuloma venereum, may also be positive since these two diseases are caused by closely related viruses. The diagnosis of Q fever is made by demonstrating the presence of specific antibody using an antigen of *Rickettsia burneti*.

Most of these tests are performed only in specially equipped laboratories; inquiry may be made at the Virus Reference Laboratory of the Public Health Laboratory Service, Colindale, at the bacteriology department of the nearest medical school, or at the nearest public health laboratory.

Antenatal Rh-testing

Q.—*Should a routine rhesus and ABO blood grouping test be carried out on every antenatal patient in respect of whom the groups are not already known? If not, on what categories of patients are such tests desirable?*

A.—Yes, ideally every antenatal patient should have her rhesus and ABO groups determined. If this is not done and the mother requires an emergency transfusion, group O Rh-negative blood would have to be given. This would be a waste of the somewhat precious Rh-negative blood in about 84% of cases. If an ungrouped patient who is in fact Rh-negative is given O Rh-positive blood, she has a 50% chance of being immunized by the transfusion—to the peril of any subsequent Rh-positive children she may bear. Routine antenatal testing may reveal the presence of unsuspected anti-Rh, and appropriate steps can then be taken for the treatment of the baby at birth.

Viper Bites in Britain

Q.—*What is the treatment now recommended for viper bites (a) immediately and (b) after an hour or so when the patient appears in the surgery? What are the indications for giving serum, and what is the dosage? Is transfer to hospital necessary?*

A.—The vast majority of snakes strike only when disturbed or attacked. The only poisonous snake in Great Britain, *Vipera berus*, is relatively harmless and could cause serious damage only to small children and then rarely, although the results may be unpleasant. Even educated people often exaggerate greatly the size, appearance, and ferocity of any snake that may "attack" them. The immediate treatment is by reassurance and recumbency, as many people seem to become faint. A ligature applied proximal to the wound, enlargement of the wound, and then sucking or irrigation are universally recommended. It has been suggested that a tourniquet should constrict only lightly, so as to encourage local bleeding. Many irrigating fluids have been advised; 1:60 calcium chloride or 1:500 sodium hypochlorite solution are among the least objectionable. Cauterization or the application of solid potassium permanganate can only cause local destruction of the tissues and may make a possibly trivial injury much more serious. Alcohol is not now recommended, but a drink of coffee would be harmless.

After an hour or so most of these measures would have little effect, but reassurance and irrigation of the enlarged wound should still be undertaken. Antivenins are rarely indicated, if ever, for viper bites in Britain; even with more venomous snakes their value has been much debated of late. Anaphylactic reactions may be very severe. There is no standard dosage and the recommendations of the suppliers must be followed with each sample, as they vary greatly. Late effects such as bruising and inflammation must be dealt with as they arise and along general lines. Their severity would be the only indication for removal to hospital, except in the very young or very old. These remarks apply, of course, only to bites sustained in Britain.

Inheritance of Achondroplasia

Q.—*Is achondroplasia inherited? A patient of mine with achondroplasia wishes to marry his first cousin. There is no other known case of achondroplasia in the family.*

A.—Largely owing to the excellent Danish work carried out in recent years the genetics of achondroplasia are well understood. This particular work was reviewed in an annotation in the *Journal* of March 5, 1949 (p. 402). Achondroplasia is an inherited defect transmitted as a dominant. The mutation rate is high, and in fact the majority of instances are directly due to a mutation in one or other of two normal parents. Once the gene has appeared in this way it will be transmitted to further generations in the usual manner. Hence there is almost certainly a 50% chance that any child of the projected marriage will be an achondroplastic dwarf. The fact that the patient proposes to marry a cousin has no bearing on the result; with a dominant gene a normal person, whether a cousin or not, is equivalent to any other normal person.

Protection from Sunlight

Q.—*How can the face of a 1-year-old boy who is sensitive to sunlight be protected from injury?*

A.—Yellow soft paraffin, titanium dioxide, tannic acid, quinine, ichthyol, and para-aminobenzoic acid are some of the many substances which will protect against sunlight. Para-aminobenzoic acid, 15% in a cold-cream base, or equal parts of "siccolam," soft paraffin, and an emulsifying base—for example, Halden's emulsifying base—are useful preparations. If the sensitiveness is not very marked the use of a foundation lotion of equal parts of calamine, glycerin, and water and the subsequent application of an ichthyol powder as face powder may be sufficient.

Glycosuria and Lactosuria in Pregnancy

Q.—*Testing the urine of patients three to four months pregnant I have found that Benedict's solution is not infrequently reduced, and I presume that this may be due to lactosuria. Are any further investigations necessary in such patients, and, if so, what practical measures can be taken in a country practice where laboratory facilities are difficult to obtain?*

A.—The reaction may be due to lactose but is often indicative of glycosuria, because the renal threshold tends to be lowered in pregnancy. A rough and simple test in such cases is to give the patient 50 g. of glucose, or a meal of high carbohydrate content, and to collect all the urine passed in the next

three hours. If this mixed sample does not give any stronger reaction than previous samples it can be assumed fairly safely that the reducing agent is not glucose. If, however, the test becomes obviously more strongly positive after the meal, the condition is almost certainly glycosuria and a full glucose-tolerance test must be carried out if the occasional case of diabetes mellitus is to be excluded.

Vasomotor Rhinitis

Q.—*What forms of therapy will relieve the discomfort of nasal obstruction arising from a swelling of the soft tissues lining the nasal airways? The obstruction takes place indoors, and especially when in bed at night. Change of posture and exercise, particularly in the open air, give a free airway temporarily. Ephedrine spray and the other decongestants give transient relief, if not repeated too often. There is no evidence now of an infection which was successfully treated 10 years ago by a bilateral intranasal antrostomy. The air passages have otherwise been declared free from any mechanical obstruction.*

A.—The probable diagnosis is vasomotor rhinitis, which may respond to so-called "diastolization." This is essentially a method of massaging the spongy tissues covering the turbinates by means of soft rubber hollow bougies connected to a Politzer bag. Should this prove insufficient, linear cautery of the inferior turbinates should be tried. If all minor treatment fails, removal of part of the middle, or of the enlarged posterior ends of the inferior, turbinates is indicated.

Ascorbic Acid Oxidase

Q.—*In an annotation, "Vitamin C and Benzene Poisoning," in the Journal of December 31, 1949, there is a reference to the work of Ekman, who found that greater protection was given to guinea-pigs exposed to benzene vapour when ascorbic acid and ascorbic acid oxidase were given than when ascorbic acid alone was used. At the present season it is difficult to obtain cucumbers, which contain large amounts of ascorbic acid oxidase. What other sources of ascorbic acid oxidase are available at this time of the year and suitable for consumption?*

A.—Ekman stated that he got better results with ascorbic acid and a source of ascorbic acid oxidase or with citrin. Cucumber is one of the best sources of ascorbic acid oxidase, but other sources are fresh uncooked fruit and vegetables. The ascorbic acid oxidase is formed when these are macerated or shredded and is destroyed on boiling.

Loewi's Mydriatic Test

Q.—*What is the mechanism of Loewi's mydriatic test in cases of acute pancreatitis, and is this test of any value in cases of subacute or chronic pancreatitis?*

A.—The explanations advanced for Loewi's mydriatic test are more ingenious than credible. The two most frequently cited are that irritation of the coeliac ganglion by the inflamed pancreas renders the sympathetic nervous system unduly sensitive to adrenaline, and that hypo-insulinism, by evoking hyper-adrenalism, has the same effect.

The test has to be regarded as non-specific; negative results occur in some cases of acute pancreatitis and positive in some other diseases, notably thyrotoxicosis. It is probably true to say that most clinicians have discarded the test as worthless.

Anal Fissure

Q.—*What is the best treatment for anal fissure? A patient in his eightieth year and in fair health suffers daily agony during and after defaecation. Is there a cure and, if so, is it permanent?*

A.—The treatment of anal fissure may be palliative, or by injection, or surgical. Palliative treatment (the avoidance of constipation, careful anal hygiene at stool, and the subsequent use of an analgesic ointment) is likely to be effective only in early cases. The infiltration of the tissues immediately subjacent to the fissures and of the corresponding part of the external sphincter muscle with 10–15 ml. of "proctocaine" is very often most successful. If this should fail, excision of the entire fissure and section of the underlying external sphincter muscle will give certain relief at the price of a rather lengthy healing period (the discomforts of which can be considerably reduced by hot baths and by infra-red light). In the case under consideration any prolonged period in bed is probably better avoided, and hence injection (at least once) would seem strongly indicated.

Prognosis in Hemiplegia

Q.—*What is the prognosis in hemiplegia where there is no other disturbance of cerebral function? When should walking exercises be begun and how long does it usually take to establish complete or partial recovery? What sort of treatment is called for in these cases in elderly people?*

A.—In cases of acquired hemiplegia of vascular origin, the prognosis naturally depends upon the severity of the lesion, which cannot always be estimated at the time of onset. Sometimes recovery is almost complete. In such cases there is usually fairly rapid improvement in the course of the first two or three weeks. In more severe cases recovery in the upper limbs is always incomplete, for the patient is likely to have little power in the hand, but walking almost always becomes possible. The patient can usually be allowed to make some attempt at standing three weeks after the stroke, and should be able to walk a little in another three or four weeks; the maximum improvement is likely to be reached in three to six months. Some details of the management of patients following cerebral haemorrhage were given, in reply to another question, in the issue of March 18 at p. 681.

NOTES AND COMMENTS

Adrenaline Cream.—Mr. P. G. SHUTE (Epsom, Surrey) writes: As the reply given under this heading in "Any Questions?" (March 18, p. 681) suggests that adrenaline cream is of little or no value, I would like to state that in my case I am confident that it has been highly beneficial. In 1943 I suffered a severe attack of sciatica, and for the past six years I have been a victim of almost continuous pain in the region of the ribs and shoulders from what has been diagnosed as fibrositis. Daily massage combined with radiant heat for months on end gave me only temporary relief. I also had numerous Turkish baths combined with massage over a period of two years, and these too gave me freedom from pain for at the most a few hours. Three months ago I tried adrenaline cream (1–5,000), and in my experience it has been well worth while. The dull aching pain around my ribs has cleared up, and although I still get pain on the points of the shoulders adrenaline cream brings relief within the hour of its application, even if it is merely smeared on without deep massage.

Survival of the Flea.—Dr. ADAIR GIRBY (Edinburgh) writes: With reference to Mr. G. C. Adeney's remarks (February 18, p. 448) on the sudden appearance of large numbers of fleas in a semi-ruined building, the explanation is more or less as follows. Fleas will lay their eggs, sometimes in enormous numbers, in empty buildings or occupied premises which are subsequently evacuated. The matting on the floor, so common in Eastern countries, constitutes an ideal nidus for the eggs, which in the absence of any stimuli remain in a quiescent state for months or even years. As soon as the building is entered, however, the vibration of footsteps will activate the insects, which are apparently ready to emerge instantly if given the opportunity. Accordingly they hatch out by the score and make for the cause of the disturbance, be it human or animal. In the course of a few minutes it is possible to be almost completely covered with a carpet of writhing, newborn fleas, busily disporting themselves after their long entombment. Visitors entering in white drill suits are observed to emerge hurriedly, apparently clad in black from head to foot. It is altogether a most alarming experience.

Correction.—Dr. HUGH MCLAREN (Birmingham) writes: In my article on "Cancer of the Uterus in Adrenogenitalism" (April 1, p. 763) there is an error. The reference to "serum potassium, 320 mg. per 100 ml." should have read "serum sodium, 300 mg. per 100 ml.; serum potassium 20 mg. per 100 ml."

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs.
ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Britmedads, Westcent, London.*
MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra, Westcent, London.*
B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.